975/3

Vol. 975 Number 3

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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October 17, 1978

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

October 17, 1978 Volume 975 Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) Implementation: Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of May 16, 1978.

LUTRELLE F. PARKER,
May 2, 1978. *Acting Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,590,016, Re. S.N. 936,891, Filed Aug. 25, 1978, Cl. 260/29.6 H, POLYMERIZABLE MONOMERS, John Joseph Hopwood, Owner of Record: *Dulux Australia Ltd., Clayton Victory, Australia,* Attorney or Agent: John W. Malley, et al., Ex. Gp.: 141

3,680,384, Re. S.N. 934,452, Filed Aug. 17, 1978, Cl. 73/361, TWO WIRE TELEMETRY SYSTEM, Earl A. Grindheim, Owner of Record: *Rosemount Inc., Minneapolis, Minn.,* Attorney or Agent: Sidney Neuman, et al., Ex. Gp.: 244

3,859,594, Re. S.N. 934,451, Filed Aug. 17, 1978, Cl. 324/57 R, TWO WIRE CURRENT TRANSMITTER RESPONSIVE TO A RESISTANCE SENSOR INPUT SIGNAL, Earl A. Grindheim, Owner of Record: *Rosemount Inc., Minneapolis, Minn.,* Attorney or Agent: Sidney Neuman, et al., Ex. Gp.: 252

3,868,434, Re. S.N. 932,822, Filed Aug. 10, 1978, Cl. 260/880 R, POLYMER COMPOSITION AND PROCESS, Richard C. Westphal, et al., Owner of Record: *American Hoechst Corporation, Somerville, N.J.,* Attorney or Agent: Leroy G. Sinn, et al., Ex. Gp.: 144

3,994,290, Re. S.N. 934,730, Filed Aug. 18, 1978, Cl. 128/57, MASSAGE DEVICE, William E. Springer, et al., Owner of Record: *Clairol Incorporated, New York, N.Y.,* Attorney or Agent: Leonard W. Sherman, et al., Ex. Gp.: 335

3,996,311, Re. S.N. 932,821, Filed Aug. 10, 1978, Cl. 260/880 R, GRAFT POLYBUTADIENE-STYRENE INTERPOLYMERS AND PROCESS FOR MAKING SAME, Richard C. Westphal and Paul Heinig, Owner of Record: *American Hoechst Corporation, Somerville, N.J.,* Attorney or Agent: Leroy G. Sinn, et al., Ex. Gp.: 144

4,012,991, Re. S.N. 868,030, Filed Mar. 9, 1978, Cl. 90/13.05, KEY DECODING AND DUPLICATING APPARATUS AND METHOD, Tim M. Uyeda, Owner of Record: *Klaus W. Gartner, La Palma, Calif.,* Attorney or Agent: L. J. Bovasso, et al., Ex. Gp.: 324

4,016,763, Re. S.N. 934,450, Filed Aug. 17, 1978, Cl. 73/362 AR, TWO WIRE CURRENT TRANSMITTER RESPONSIVE TO A RESISTIVE TEMPERATURE SENSOR INPUT SIGNAL, Earl A. Grindheim, Owner of Record: *Rosemount Inc., Minneapolis, Minn.,* Attorney or Agent: Sidney Neuman, et al., Ex. Gp.: 244

4,033,722, Re. S.N. 888,691, Filed Mar. 20, 1978, Cl. 23/230.3, ASSARY FOR MYASTHENIA GRAVIS, Jon M. Lindstrom, Owner of Record: *The Salk Institute for Biological Studies, San Diego, Calif.,* Ex. Gp.: 171

4,034,389, Re. S.N. 933,781, Filed Aug. 14, 1978, Cl. 354/322, APPARATUS FOR DEVELOPING A TRAVELLING PHOTOGRAPHIC EMULSION CARRIER, Heinrich Huss, Owner of Record: *Inventor,* Attorney or Agent: Ralph R. Roberts, Ex. Gp.: 211

4,068,184, Re. S.N. 929,679, Filed Jul. 31, 1978, Cl. 330/257, CURRENT MIRROR AMPLIFIER, Adel Abdel Aziz Ahmed, Owner of Record: *RCA Corporation, Princeton, N.J.,* Attorney or Agent: H. Christoffersen, et al., Ex. Gp.: 252

4,075,928, Re. S.N. 933,720, Filed Aug. 14, 1978, Cl. 91/29, SAFETY VALVE FOR FLUID SYSTEMS, Paul A. Bitonti, Owner of Record: *Ross Operating Valve Company, Detroit, Mich.,* Attorney or Agent: Paul F. Seibold, et al., Ex. Gp.: 341

4,084,001, Re. S.N. 933,254, Filed Aug. 10, 1978, Cl. 424/322, PHARMACOLOGICALLY ACTIVE COMPOUNDS, Graham John Durant, et al., Owner of Record: *Smith Kline & French Laboratories Limited, Welwyn Garden City, England,* Attorney or Agent: William H. Edgerton, et al., Ex. Gp.: 125

PATENT NOTICES

Certificates of Correction for the Week of Oct. 17, 1978

Re. 29,618	4,047,586	4,077,385	4,085,010
D. 243,367	4,048,344	4,077,967	4,085,106
3,700,683	4,048,877	4,078,257	4,085,137
3,701,443	4,050,158	4,078,465	4,085,229
3,763,183	4,051,147	4,078,618	4,085,456
3,771,501	4,051,952	4,078,866	4,085,572
3,787,460	4,052.222	4,079,125	4,085,617
3,868,941	4,054,383	4,079,237	4,085,637
3,948,831	4,054,610	4,079,318	4,086,045
3,949,646	4,055,727	4,079,390	4,086,254
3,950,217	4,056,429	4,079,748	4,086,824
3,962,187	4,057,123	4,079,827	4,087,020
3,968,308	4,061,479	4,080,089	4,087,318
3,970,830	4,061,586	4,080,140	4,087,367
3,975,282	4,061,758	4,080,367	4,087,532
3,978,234	4,062,291	4,080,396	4,087,757
3,995,686	4,062,672	4,080,412	4,087,777
3,997,663	4,062,863	4,080,893	4,088,206
3,998,790	4,064,138	4,080,927	4,088,222
4,012,496	4,064,550	4,081,279	4,088,331
4,013,783	4,065,191	4,081,371	4,088,585
4,017,524	4,065,349	4,081,544	4,088,659
4,022,758	4,065,570	4,081,555	4,088,679
4,026,972	4,065,640	4,081,734	4,088,778
4,028,807	4,068,031	4,081,825	4,088,784
4,030,812	4,068,252	4,082,072	4,089,173
4,031,517	4,069,271	4,082,156	4,089,194
4,032,782	4,069,662	4,082,333	4,089,362
4,033,667	4,071,681	4,082,645	4,090,179
4,035,296	4,072,689	4,082,777	4,090,223
4,037,031	4,073,906	4,083,141	4,090,300
4,038,521	4,074,014	4,083,242	4,090,780
4,039,878	4,074,302	4,083,301	4,090,891
4,040,089	4,074,852	4,083,406	4,091,174
4,043,299	4,075,680	4,083,865	4,091,471
4,043,840	4,075,912	4,083,902	4,091,797
4,043,964	4,076,367	4,084,182	4,092,049
4,045,422	4,076,606	4,084,352	4,092,450
4,045,664	4,076,648	4,084,424	4,093,778
4,046,270	4,077,107	4,084,680	
4,046,609	4,077,363	4,084,923	

Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,779,860, O. A. Oshida and M. Shawgo, THERMAL AND ACOUSTICAL STRUCTURAL INSULATING COMPOSITION, Interference No. 99,545, decided July 17, 1978, claims 1, 2, 4 and 11.

Patent No. 3,819,043, T. S. Harrison, DISPENSER PACK FOR PRE-MOISTENED TOWELETTES, Interference No. 99,184, decided May 9, 1978, claims 1, 5 and 11–13.

Patent No. 3,907,316, H. Marker, H. Kroger and H. Steinmetz, METHOD AND DEVICES FOR RELEASING A SKI BOOT FROM THE SKI. Interference No. 99,297, decided May 1, 1978, claims 1, 3, 5–9, 11, 12, 13, 24 and 25.

Patent No. 3,908,209, W. E. Fillmore, FLUID DISPENSING APPARATUS, Interference No. 99,702, decided June 16, 1978, claims 1, 3–8 and 10–13.

Patent No. 3,952,711, J. A. Kimberley and R. D. Kraus, DIESEL INJECTION NOZZLE WITH INDEPENDENT OPENING AND CLOSING CONTROL, Interference No. 99,797, decided June 9, 1978, claims 1–6.

Patent No. 3,958,004, E. J. Cragoe, Jr. and G. M. Fanelli, Jr., PHENOXYACETIC ACID DERIVATIVES AS URICOSURIC AGENTS, Interference No. 99,606, decided July 31, 1978, claims 1–4.

Patent No. 3,978,882, G. Cornelius, MOVER UNIT FOR IRRIGATION LINE, Interference No. 99,624, decided July 17, 1978, claims 1–11.

Patent No. 3,981,945, T. E. Attwood and B. W. Farrant, COATING COMPOSITIONS COMPRISING A POLYSULFONE AND A FLUOROCARBON POLYMER, Interference No. 99,537, decided June 22, 1978, claims 1–4 and 6–9.

Patent No. 4,028,319, D. A. Jones, Jr., J. M. Schlatter, R. A. Mikulec, J. A. Reuter and R. H. Mazur, 2 AND 3-SUBSTITUTED ENKEPHALINS, Interference No. 99,833, decided July 19, 1978, claim 6.

Disclaimers

3,735,812.—*John Flavell* and *Max William Betts*, Coventry, and *Frank Robinson*, Borrowash; England. KNITTING MACHINES. Patent dated May 29, 1973. Disclaimer filed Aug. 18, 1978, by the assignee, *Courtaulds Ltd.*

Hereby enters this disclaimer to claims 1 to 16, inclusive, of said patent.

3,908,228.—*John I. Newcomer*, Rockford, Ill. SELF-CLOSING HINGE. Patent dated Sept. 30, 1975. Disclaimer filed Aug. 25, 1978, by the assignee, *Amerock Corporation.*

Hereby enters this disclaimer to all claims of said patent.

3,950,716.—*Albert R. Cellerini*, *Paul Skalka*, and *William I. Stephenson, Jr.*, Beaver, Pa. MULTI-POLE CIRCUIT BREAKER WITH ADJUSTABLE THERMAL TRIP UNIT. Patent dated Apr. 13, 1976. Disclaimer filed July 11,1978, by the assignee, *Westinghouse Electric Corporation.*

Hereby enters this disclaimer to claims 1–6 of said patent.

3,950,717.—*Albert R. Cellerini* and *Louis N. Ricci*, Beaver Falls, Pa. MULTI-POLE CIRCUIT BREAKER WITH ADJUSTABLE THERMAL TRIP UNIT. Patent dated Apr. 13, 1976. Disclaimer filed July 11, 1978, by the assignee, *Westinghouse Electric Corporation.*

Hereby enters this disclaimer to claims 1–6 of said patent.

3,969,950.—*Jim Lee Rau*, Lafayette, and *Hollis Newcomb White, Jr.*, West Lafayette, Ind. DRIVE ASSEMBLY. Patent dated July 20, 1976. Disclaimer filed Aug. 28, 1978, by the assignee, *TRW Inc.*

Hereby enters this disclaimer to claims 1, 2, 9, 12, 13, 16 and 17 of said patent.

3,970,086.—*Ernest Cheslow*, Glencoe, Ill. DISPOSABLE DIAPER HAVING TAB FASTENING MEANS WITH ONE END THEREOF RELEASABLY ADHERED TO DIAPER. Patent dated July 20, 1976. Disclaimer filed Aug. 25, 1978, by the assignee, *Johnson & Johnson.*

Hereby enters this disclaimer to claims 6, 7 and 8 of said patent.

4,009,799.—*George H. Fathauer*, Mesa, Ariz. MONITOR FOR SEED PLANTING APPARATUS. Patent dated Mar. 1, 1977. Disclaimer filed Aug. 25, 1978, by the assignee, *Dickey-John Corporation.*

Hereby enters this disclaimer to claims 11, 13, 14, 15, 17, and 18 of said patent.

4,021,490.—*Paul S. Hudson,* Bartlesville, Okla. PROCESS FOR PRODUCTION OF PHENOL AND CYCLOHEXANONE. Patent dated May 3, 1977. Disclaimer filed Aug. 14, 1978, by the assignee, *Phillips Petroleum Company.*

Hereby enters this disclaimer to claim 13 of said patent.

4,037,267.—*Thaddeus William Kisor,* Flemington, N.J. PACKAGE FOR SEMICONDUCTOR COMPONENTS. Patent dated July 19, 1977. Disclaimer filed Aug. 30, 1978, by the assignee, *RCA Corporation.*

Hereby enters this disclaimer to claims 1–9, inclusive, of said patent.

4,047,540.—*Myrl E. Orme,* Canoga Park, and *Ralph L. Vick,* Granada Hills, Calif. MULTI-PATH VALVE STRUCTURE HAVING EXTENDED LIFE AND BACKWASHING CAPABILITY. Patent dated Sept. 13, 1977. Disclaimer filed Aug. 14, 1978, by the assignee, *The Bendix Corporation.*

Hereby enters this disclaimer to claims 11, 12 and 13 of said patent.

4,068,336.—*Michael M. Becka,* Nashua, N.H. MACHINE FOR CLAMPING THE HEEL PORTION OF AN UPPER TO THE CORRESPONDING PORTION OF A FORM. Patent dated Jan. 17, 1978. Disclaimer filed Aug. 23, 1978, by the assignee, *International Shoe Machine Corporation.*

Hereby enters this disclaimer to claims 1 through 18 of said patent.

Dedications

3,913,258—*Anthony J. Souza,* Lancaster, and *Harlan W. Martin,* New Holland, Pa. COLLAPSIBLE LIVE ANIMAL TRAP. Patent dated Oct. 21, 1975. Dedication filed Aug. 22, 1978, by the assignee, *Woodstream Corporation.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,979,377.—*Edward Ephraim Jaffe,* Union, N.J., *William Joseph Marshall,* Wilmington, Del., and *Ernest Anton Stefancsik,* Flemington, N.J. YELLOW AZO PIGMENT AND PROCESS OF PREPARATION FROM DICHLOROANILINE AND BARBITURIC ACID. Patent dated Sept. 7, 1976. Dedication filed Aug. 16, 1978, by the assignee, *E. I. du Pont de Nemours and Company.*

Hereby dedicates said patent to the Public.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator
National Technical Information Service.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

Patent 3,981,144. Dual Stage Supersonic Diffuser. Filed Oct. 28, 1975. Patented Sept. 21, 1976.

Patent 3,981,264. Droplet Impact Recorder. Filed Jan. 16, 1975. Patented Sept. 21, 1976.

Patent 3,981,450. In-Flight Modulating Thrust Reverser. Filed Sept. 22, 1975. Patented Sept. 21, 1976.

Patent 3,981,467. Launch Lock Device. Filed Oct. 17, 1975. Patented Sept. 21, 1976.

Patent 3,981,588. Means and Method for Determining Meridian Location and Azimuth. Filed Aug. 5, 1974. Patented Sept. 21, 1976.

U.S. DEPARTMENT OF AGRICULTURE
Research Agreements and Patent Branch, General Services Division, Federal Bldg., Agricultural Research Service Hyattsville, Md. 20782

Patent 3,953,607. Method of Controlling Insects Using 7-Ethoxyl-1-(p-Ethylphenoxyl)-3,7-Dimethyl-2-Octene. Filed Nov. 26, 1974. Patented Apr. 27, 1976.

Patent 3,978,932. Apparatus and Method for Obtaining Undisturbed Soil Core Samples. Filed Jan. 28, 1975. Patented Sept. 7, 1976.

Patent 3,981,100. Highly Absorbant Starch-Containing Polymeric Compositions. Filed Sept. 8, 1975. Patented Sept. 21, 1976.

Patent 3,983,067. Diacetal Derivatives of Polyunsaturated Fatty Esters as Primary Plasticizers for Polyvinylchloride. Filed July 1, 1974. Patented Sept. 28, 1976.

Patent 3,984,361. Preparation of Starch Graft Polymer Latexes by Sonification. Filed May 30, 1975. Patented Oct. 5, 1976.

U.S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
National Institutes of Health, Chief, Patent Branch Westwood Bldg., Bethesda, Md. 20014

Patent 981,176. Dual Frequency Acoustic Gas Composition Analyzer. Filed Sept. 16, 1974. Patented Sept. 21, 1976.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th and C Sts. Washington, D.C. 20240

Patent 3,949,353. Underground Mine Surveillance System Filed June 23, 1975. Patented Apr. 6, 1976.

Patent 3,971,226. Prestresses Roof Support System. Filed Oct. 31, 1975. Patented July 27, 1976.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research Code 302, Arlington, Va. 22217

Patent 3,982,178. Method of Determining Adequency of Substrate Memory Wire During the Plating Process. Filed Jan. 29, 1975. Patented Sept. 21, 1976.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters NASA—Code GP–2, Washington, D.C. 20546

Patent 3,965,096. Ultraviolet and Thermally Stable Polymer Compositions. Patented June 22, 1976.

U.S. DEPARTMENT OF AGRICULTURE
Research Agreements and Patent Branch, General Services Division, Federal Bldg., Agricultural Research Service Hyattsville, Md. 20782

Patent 3,960,902. Synthetic Hormones for Insect Control. Filed July 2, 1975. Patented June 1, 1976.

Patent 3,970,688. Synthetic Hormones for Insect Control. Filed July 2, 1975. Patented July 20, 1976.

Patent 3,975,560. Phosphorus and Nitrogen Containing Resins for Flameproofing Organic Textiles. Filed Aug. 22, 1974. Patented Aug. 17, 1976.

Patent 3,982,014. Arthropod Maturation Inhibitors. Filed Mar. 24, 1975. Patented Sept. 21, 1976.

Patent 3,985,616. Immobilization of Enzymes With a Starch-Graft Copolymer. Filed Sept. 8, 1975. Patented Oct. 12, 1976.

Patent 3,985,921. Treatment of Wood With Butylene Oxide. Filed June 18, 1975. Patented Oct. 12, 1976.

Patent 3,986,259. Rotary Bark Hack. Filed Apr. 17, 1976. Patented Oct. 19, 1976.

Patent 3,987,058. Preparation and Uses of Stable, Bound Stationary Phases. Filed Feb. 27, 1975. Patented Oct. 19, 1976.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents Washington, D.C. 20545

Patent 3,915,695. Method for Treating Reactive Metals in a Vacuum Furnace. Filed Jan. 8, 1974. Patented Oct. 28, 1975.

Patent 3,924,675. Energy Absorber for Sodium Heated Heat Exchanger. Filed May 3, 1973. Patented Dec. 9, 1975.

Patent 3,928,027. Nonswelling Alloy. Filed Aug. 20, 1974. Patented Dec. 23, 1975.

Patent 3,934,239. Adjustable Electronic Load-Alarm Relay. Filed Sept. 27, 1974. Patented Jan. 20, 1976.

U.S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
National Institutes of Health, Chief, Patent Branch
Westwood Bldg., Bethesda, Md. 20014

Patent 3,983,118. Production of N-5-Methyltetrahydrohomofolic Acid and Related Reduced Derivatives of Homofolic Acid. Filed Aug. 16, 1974. Patented Sept. 28, 1976.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th and C Sts.
Washington, D.C. 20240

Patent 3,977,312. Parachute Stopping for Mine Ventilation Use. Filed Oct. 31, 1975. Patented Aug. 31, 1976.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
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	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
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	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
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Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF SEPTEMBER 23, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	11-4-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-5-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	1-30-78
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	8-19-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	9-23-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors: Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-2-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordinance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	3-28-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	8-2-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	3-20-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	2-17-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	1-3-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	7-18-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	10-6-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors: Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	6-13-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GRAY, Director. Power Plants; Combustion Engines; Fluid Motors: Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	8-8-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures: Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	8-24-77

Expiration of patents: The patents within the range of numbers indicated below expire during August 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 2,994,087 to 2,998,605, inclusive
Plant Patents ..... Numbers 2,085 to 2,094, inclusive

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,800

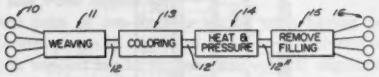
METHOD OF TREATING YARNS TO PROVIDE KINKING AND/OR MOTTLED EFFECTS IN FABRICS

Kirkland H. Gibson, North Kingstown, and Henry E. Protzmann, East Greenwich, both of R.I., assignors to H. G. P. Corp., Johnston, R.I.

Original No. 3,605,225, dated Sep. 20, 1971, Ser. No. 853,042, Aug. 26, 1969. Application for reissue Apr. 15, 1977, Ser. No. 787,745

Int. Cl.[2] D02G *1/00*

U.S. Cl. 28—218 **5 Claims**



1. The method of simultaneously treating a plurality of yarns which comprises providing a plurality of relatively large warp yarns, weaving in a selected fabric construction said warp yarns with [a] *one single continuous* filling yarn of a relatively smaller diameter than said warp yarns and disposed with relation to said warp yarns *a greater distance apart than the warp yarns and* in *knit-like loops along one edge, each filling yarn loop knitted to the preceding loop to provide* a continuous unweavable relation[,] *from one end only,* coloring said fabric *while in said unweavable relation* to color the warp yarns, the weave selection providing the character of the kink imparted to the warp yarn, *moving said fabric to another station* and [unweaving] *continuously pulling on said filling yarn to unweave* said filling yarn *and then packaging the separated warp yarns* to provide a plurality of colored *warp* yarns of controlled kink character ranging from no *perceptible* kink to high kink amplitude for reworking into various forms.

Re. 29,801

SWAGING APPARATUS

Jon K. Whitledge, Mantua, Ohio, assignor to Samuel Moore And Company, Aurora, Ohio

Original No. 3,858,298, dated Jan. 7, 1975, Ser. No. 313,792, Dec. 11, 1972. Continuation-in-part of Ser. No. 216,093, Jan. 7, 1972, Pat. No. 3,785,050. Application for reissue Oct. 26, 1977, Ser. No. 845,577

The portion of the term of this patent subsequent to January 15, 1991, has been disclaimed.

Int. Cl.[2] B23P *19/02*

U.S. Cl. 29—237 **1 Claim**

5. An apparatus for securing a fitting to a hose which comprises a ball screw and ball nut assembly, a swaging die having a die cavity adjacent one end of the screw with the cavity aligned with the screw, means for supporting said ball nut and said die against relative longitudinal movement and against rotation with the screw comprising a cast one-piece frame having a first end member, a second end member spaced longitudinally from the first end member and a pair of laterally spaced side support members integral at one end thereof with the said first end member and integral at the other end with the said second end member, an opening through the said first end member and an opening through the second end member for supporting the swaging die, said openings having a common axis, said ball screw passing through said opening through the first end member and said ball nut secured to said first end member, means carried by said end of the screw for pressing a fitting and hose assembly in said die cavity comprising a holder element secured to the said screw end for rotation therewith and having a cavity therein, a pusher element having one end in the cavity of the holder element and an opposite end adapted to support a fitting and hose assembly as it is moved towards the die cavity, means for securing the pusher element in the cavity of the holder element against rotation with the screw and against substantial longitudinal movement relative to the screw comprising a thrust bearing in the cavity of the holder element and about the said pusher, a generally triangularly shaped clamp pivotally secured at its apex to each of said side support members and having an arcuate shaped base disposed to press the die into the opening through the said second end member of the frame, and means for turning the screw in the nut.

Re. 29,802

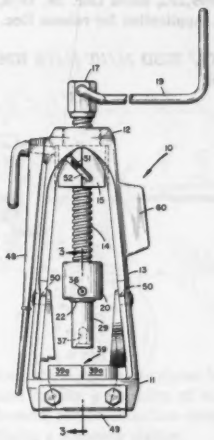
SWAGING APPARATUS

Jon K. Whitledge, Mantua, and Edward M. Kavick, Chardon, both of Ohio, assignors to Samuel Moore and Company, Aurora, Ohio

Original No. 3,858,298, dated Jan. 7, 1975, Ser. No. 313,792, Dec. 11, 1972. Continuation-in-part of Ser. No. 216,093, Jan. 7, 1972, Pat. No. 3,785,050. Application for reissue Oct. 26, 1977, Ser. No. 845,576

Int. Cl.[2] B23P *19/02*

U.S. Cl. 29—237 **3 Claims**



1. An apparatus for securing a fitting to a hose which comprises a ball screw and ball nut assembly, a swaging die having a die cavity adjacent one end of the screw with the cavity aligned with the screw, means for supporting said ball nut and said die against relative longitudinal movement and against rotation with the screw comprising a cast one-piece frame having a first end member, a second end member spaced longitudinally from the first end member and a pair of laterally spaced side support members integral at one end thereof with the said first end member and integral at the other end with the said second end member, an opening through the said first end member and an opening through the second end member for supporting the swaging die, said openings having a common axis, said ball screw passing through said opening through the first end member and said ball nut secured to said first end member, means carried by said end of the screw for pressing a fitting and hose assembly in said die cavity comprising a holder element secured to the said screw end for rotation therewith and having a cavity therein, a pusher element having one end in the cavity of the holder element and an opposite end adapted to support a fitting and hose assembly as it is moved towards the die cavity, means for securing the pusher element in the

cavity of the holder element against rotation with the screw and against substantial longitudinal movement relative to the screw comprising a thrust bearing in the cavity of the holder element and about the said pusher, and means for turning the screw in the nut.

Re. 29,803

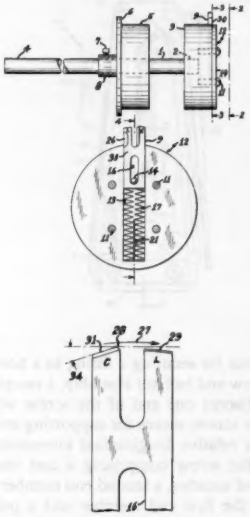
PIPE CUTTING TOOL

Clinton E. Breese, Ponte Vedra Beach, Fla., assignor to Breese Manufacturing, Inc., Jacksonville Beach, Fla.

Original No. 3,999,292, dated Dec. 28, 1976, Ser. No. 617,378, Sep. 29, 1975. Application for reissue Dec. 27, 1977, Ser. No. 864,932

Int. Cl.[2] B23D *21/10, 21/14;* B26D *3/16*

U.S. Cl. 30—105 **15 Claims**



11. In an inside tube cutter comprising a body member adapted to be disposed and rotated on a predetermined axis in a predetermined direction inside a tube, a bifurcated cutting bit comprising a cutting leg and leading cutting depth control leg, and means slideably mounting said bit on said body member for sliding inwardly and outwardly thereof and with said legs extending outwardly of said member and lying in a plane normal to said rotational axis and with said leading leg disposed in said predetermined direction from said cutting leg, said cutting leg terminating outwardly in a cutting edge disposed outwardly a short distance beyond the outer end of said leading leg as measured radially from said axis.

Re. 29,804

INSULATING WALL UNIT

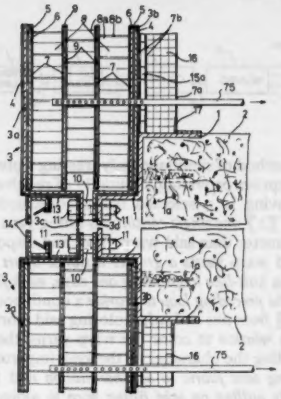
Otto Alfred Becker, Robert Koch Strasse 59, 66 Saarbruecken 6, Fed. Rep. of Germany

Original No. 3,834,096, dated Sep. 10, 1974, Ser. No. 231,815, Mar. 6, 1972. Continuation-in-part of Ser. No. 826,958, May 22, 1969, Pat. No. 3,646,721, and a continuation-in-part of Ser. No. 37,068, May 13, 1970. Application for reissue Oct. 17, 1977, Ser. No. 843,050

Claims priority, application Fed. Rep. of Germany, May 22, 1968, 1759635; Sep. 21, 1968, 1784816; Mar. 29, 1969, 1916384; May 13, 1969, 1924313; May 21, 1969, 1925789; Jun. 25, 1969, 1932202

Int. Cl.[2] E04B *1/74*

U.S. Cl. 52—172 **11 Claims**



1. In a wall unit comprising panels laying at opposite faces of said unit, a seal arranged between the margins of said panels to air-tightly seal the wall unit, and an insulation occupying the cavity between said panels, the improvement which consists in additionally providing the wall unit at its one side with an additional panel, spaced from the wall unit and forming therewith an associated cavity, said additional panel being permeable to condensed moisture, air, and vapors and allowing the condensed moisture deposited thereon to pass therethrough into said associated cavity, said associated cavity serving to eliminate moisture condensed on said additional panel.

Re. 29,805

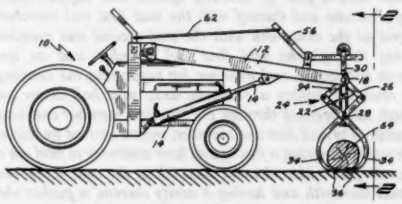
LOADER ATTACHMENT FOR HANDLING LOGS, BALES AND THE LIKE

Edward L. Koehnen, Akeley, Minn. 56433

Original No. 4,030,625, dated Jun. 21, 1977, Ser. No. 717,949, Aug. 26, 1976. Application for reissue Feb. 27, 1978, Ser. No. 881,841

Int. Cl.[2] B66C *1/62*

U.S. Cl. 214—147 G **6 Claims**



1. A loader attachment for use with a prime mover having parallel, spaced apart, power actuated, front end loader sup-

port arms extending outwardly therefrom; said loader attachment including:

a. a main horizontal frame support bar pivotally mounted [in] *with respect to* outer ends of said support arms;

b. [a pair of vertical guides extending downwardly from the said frame support bar in spaced relation to each other and symmetrically about the center of the frame support bar] *a horizontal hook support bar situated in vertical alignment below said main horizontal frame support bar and parallel to it;*

c. [a horizontal hook support bar extending through the vertical guides] *guide means operably associated with respect to said main frame support bar and said hook support bar to permit relative vertical movement of said frame support bar and said hook support bar with respect to each other while maintaining said hook support bar in the same vertical plane as said frame support bar;*

d. two pairs of jaw-forming hooks, each having central portions pivotally supported, one pair of each end of said hook support bar in approximate vertical alignment beneath said frame support bar;

e. a rigid link pivotally connecting an upper[, outer] end portion of each of said hooks with [a vertically aligned portion of] *respect to* said frame support bar;

f. a hook support bar lifting strap integral with and extending upwardly from said hook support bar;

g. said [guides] *guide means* being of configuration to permit movement of said hook support bar between a first lower position wherein each of the hooks of each pair of hooks is in closed, adjacent relationship to the other hook of said pair of hooks, and a second upper position wherein said hooks are spaced at a maximum distance away from each other; and

h. means for moving said hook support bar lifting strap to move said hook support bar between said first and said second positions.

Re. 29,806

ROTOR HOUSING FOR A ROTARY PISTON TYPE ENGINE AND METHOD FOR MANUFACTURING THE SAME

Hirotaka Iida, No. 2002-47, Hesaka-cho, Hiroshima-shi, Hiroshima-ken; Hiroshi Masaoka, No. 616, Onaga-machi, Hiroshima-shi, Hiroshima-ken; Michinobu Yamada, No. 2-31, 5-chome, Ujinahigashi, Hiroshima-shi, Hiroshima-ken; Mutsuo Ichihara, No. 2110-5, Fuchu-cho, Aki-gun, Hiroshima-ken; Yoshitaka Uebayashi, No. 1412-8, Fuchu-cho, Aki-gun, Hiroshima-ken; Koji Tashiro, No. 5580, Higashikaita, Kaita-cho, Aki-gun, Hiroshima-ken, and Sadao Taketomo, No. 510-4, Aza Ohmachi, Yasufuruichi-cho, Asa-gun, Hiroshima-ken, all of Japan

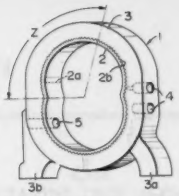
Original No. 3,934,321, dated Jan. 27, 1976, Ser. No. 459,329, Apr. 9, 1974. Application for reissue Apr. 14, 1976, Ser. No. 676,712

Claims priority, application Japan, Apr. 10, 1973, 48-40580; Apr. 11, 1973, 48-41639

Int. Cl.[2] **F01C** *21/00;* **B23P** *15/00*

U.S. Cl. 418—178 **18 Claims**

11. A rotor housing for a rotary piston type engine, comprising a liner provided by a rolled metal sheet which is scratched at one side to form a rough surface and has opposite terminal edges welded together to form a trochoidal configuration with said rough surface directed outside, and an aluminum based metal housing substrate cast around the liner, said welded terminal edges of the metal sheet being disposed within a cold zone of the housing located substantially opposite an ignition plug opening.



Re. 29,807

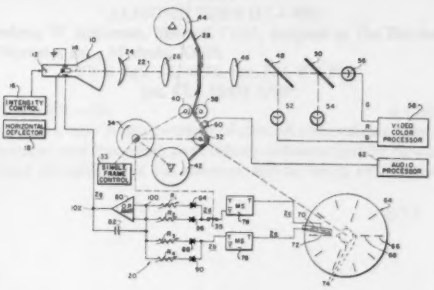
SCANNING APPARATUS RESPONSIVE TO THE MOVEMENT OF IMAGE BEARING MEDIA

Lenard M. Metzger, Brighton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Original No. 3,651,254, dated Mar. 21, 1972, Ser. No. 60,502, Aug. 3, 1970. Application for reissue May 8, 1972, Ser. No. 251,334

Int. Cl.[2] **H04N** *5/36, 5/86*

U.S. Cl. 358—54 **22 Claims**



1. In apparatus for deriving an image signal from an information bearing medium having a plurality of successive image frames disposed thereon, the combination comprising:

a. means for defining a scanning station;

b. means for moving the information bearing medium at a nominal image frame rate relative to said scanning station;

c. means for scanning repetitively at a first rate the image frames moving relative to said scanning station in a raster pattern comprising a plurality of spaced line scans and for providing an image signal of the scanned image frames;

d. first means for detecting the first rate from the movement of the information bearing medium relative to said scanning station and for producing a first signal indicative of the first rate;

e. second means for detecting the raster deflection rate of said scanning means from the movement of the information bearing medium relative to said scanning station and for producing a second signal indicative of the raster deflection rate;

f. third means responsive to said first and second signals for producing a third signal indicative of the raster deflection rate of said second signal and the first rate of said first signal; and

g. means responsive to said third signal for positioning the scanning raster pattern in synchronism with the moving image frames in accordance with said raster deflection rate and repeating the scanning raster pattern at said first rate.

PLANT PATENTS

GRANTED OCTOBER 17, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,316

PLUM TREE (25-P-40)

Frederic W. Anderson, Merced, Calif., assignor to Reedley Nursery, Inc., Reedley, Calif.

Filed Jan. 6, 1978, Ser. No. 867,369

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—38 **1 Claim**

1. A new and distinct variety of plum tree, substantially as illustrated and described, characterized—in comparison to the Cassellman and Rosemary—by a harvest about 2 weeks later, and by clingstone fruit having less exterior red color, but brighter yellow skin and flesh, and much sweeter flavor.

4,317

DWARF PEACH TREE (54-P-455)

Frederic W. Anderson, 826 W. 22nd St., Merced, Calif. 95340

Filed Jan. 6, 1978, Ser. No. 867,370

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree, substantially as illustrated and described, which, while having the desirable characteristics of the full-size Lovell, is—in comparison—genetically dwarf.

4,318

NECTARINE TREE (44-G-520)

Frederic W. Anderson, Merced, Calif., assignor to Reedley Nursery, Inc., Reedley, Calif.

Filed Jan. 6, 1978, Ser. No. 867,371

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree, substantially as illustrated and described, particularly characterized by clingstone fruit which ripens a few days later than the Late Le Grand and a few days earlier than the Regal Grand; the fruit, as further compared with said prior varieties, being, on the average, slightly smaller in size but more uniform, more attractive in appearance by reason of greater red exterior color, and of better eating quality.

4,319

ALMOND TREE (17-J-495)

Frederic W. Anderson, Merced, Calif., assignor to The Burchell Nursery, Inc., Modesto, Calif.

Filed Jan. 30, 1978, Ser. No. 873,290

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—30 **1 Claim**

1. A new and distinct variety of almond tree, substantially as illustrated and described, particularly characterized by flowers having red anthers on the stamens, and by being self-fruitful.

PLANT PATENTS

GRANTED OCTOBER 17, 1978

Descriptions for these patents are usually in print and available at a cost somewhat in excess of the drawings

PATENTS

GRANTED OCT. 17, 1978

ERRATA

For CLASS	See PATENT NO.
405–264	4,120,163
405–289	4,120,164
405–145	4,120,165
405–225	4,120,166
405–157	4,120,167
405–170	4,120,168
405–169	4,120,171
073–159	4,120,183
838–086	4,120,220
124–085	4,120,276
225–565	4,120,432
206–586	4,120,441
308–006 C	4,120,538
356–073	4,120,582
408–150	4,120,599
428–187	4,120,608
422–016	4,120,654
422–015	4,120,655
422–028	4,120,656
422–068	4,120,661
073–425.6	4,120,662
075–238	4,120,719
096–001.5 N	4,120,720
096–036.3	4,120,721
096–049	4,120,722
096–074	4,120,723
096–087 A	4,120,724
096–097	4,120,725
096–107	4,120,726
096–114	4,120,727
096–114.1	4,120,728
106–035	4,120,729
106–039.6	4,120,730
106–044	4,120,731
106–047 Q	4,120,732
106–048	4,120,733
106–067	4,120,734
106–084	4,120,735
106–090	4,120,736
106–109	4,120,737
106–288 Q	4,120,738
156–245	4,120,749
116–114 V	4,120,818
521–038	4,120,831
521–081	4,120,833
521–164	4,120,834
528–140	4,120,847

528–067 4,120,848
528–502 4,120,849
528–066 4,120,850
562–457 4,120,895
562–430 4,120,896
340–630 4,121,110
324–104 4,121,147
340–321 4,121,160
528–288 4,121,266
099–353 4,121,301

PATENTS

GRANTED OCTOBER 17, 1978

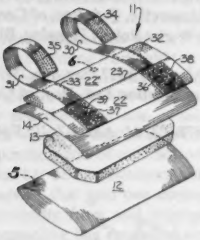
GENERAL AND MECHANICAL

4,120,052

CUSHIONED PROTECTOR

Carl D. Butler, Blanch, N.C., assignor to Royal Textile Mills, Inc., Yanceyville, N.C.

Filed Oct. 12, 1977, Ser. No. 841,343
Int. Cl.[2] A41D *13/08*
U.S. Cl. 2—16 **4 Claims**



1. A cushioned protector for aiding in preventing injury to the knee or elbow of the wearer and comprising

(a) an elongate sleeve of textile material having sufficient stretchability to be easily drawn over and resiliently engage and cover the knee or elbow of the wearer,

(b) a cushioning pad carried by said sleeve and adapted to cover and protect the knee or elbow of the wearer,

(c) flexible protective panel means extending longitudinally of said sleeve and covering at least the major portion of said cushioning pad, said panel means permitting said sleeve to slide along a rough surface and protecting the textile material from damage by said rough surface, and

(d) adjustable strap means secured adjacent opposite ends of said protector and encircling said protector, said adjustable strap means comprising a pair of elastic tapes, one end of each of said elastic tapes being secured to said protective panel means, the other end of each of said elastic tapes including one element of a separable fastener secured thereto, and including a second element of said separable fastener fixed on said protective panel for releasably connecting said one element of said separable fasteners thereto, said elastic tapes increasing the resilient engagement of opposite ends of said protector to aid in preventing the slipping of said sleeve on the knee or elbow of the wearer.

4,120,053

OBJECT-DISPENSING WEARING APPAREL

Frank R. Nemirofsky, 2837 Trotter Way, Walnut Creek, Calif. 94596

Filed Nov. 23, 1977, Ser. No. 854,300
Int. Cl.[2] A41B *1/00*
U.S. Cl. 2—115 **10 Claims**

1. A garment for dispensing novelty items of a predetermined size and shape, the garment comprising:

an article of clothing adapted to be worn by a person, the article including a portion having an outer surface, an inner surface, and an aperture formed thereon to communicate the outer surface to the inner surface, the aperture being dimensioned and configured relative to the size and shape of individual ones of the novelty items to allow only one novelty item to pass therethrough at a time;

indicia affixed to the outer surface suggesting the aperture as a point from which the novelty items may be received; and

a pocket formed by a sheet of flexible material disposed in confronting relation to the inner surface, the material having an outer periphery that is positioned in generally surrounding relation to the aperture and attached to the

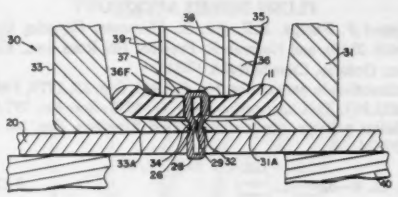
inner surface, the pocket being adapted to hold a plurality of the novelty items in general proximate position with the aperture.

4,120,054

BUTTON ASSEMBLY FOR TEXTILE MATERIAL

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Filed Oct. 6, 1976, Ser. No. 729,959
Int. Cl.[2] D05B *3/14*
U.S. Cl. 2—265 **14 Claims**



1. A fastening assembly comprising in combination with an article made of textile material,

a fastening button having at least one hole extending therethrough,

a thread-like element passing through said textile material and forming at least one loop, said thread-like element extending through said hole in said button in a manner to dispose adjacent portions of said thread-like element between said button and said textile material close to each other, and

adhesive bonding means securing said adjacent portions of said thread-like material which are disposed close to each other together between said button and said textile material.

4,120,055

TWO-STAGE TOILET FLUSHING APPARATUS

Paul F. Mormile, R.D. #1, Box 215, Mechanicville, N.Y. 12118

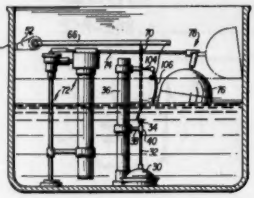
Continuation of Ser. No. 666,543, Mar. 15, 1976, abandoned.
This application Oct. 17, 1977, Ser. No. 842,825
Int. Cl.[2] E03D *1/36, 5/02*
U.S. Cl. 4—324 **10 Claims**

1. Flushing apparatus for a toilet having a water tank containing a float actuating a first valve to control the amount of water admitted to the tank and also containing a second valve operable to flush the water stored in the tank into the toilet bowl, the improvement which comprises:

handle means including a single manually actuable handle operable between a first normal position and distinct first

and second actuated positions, said handle in its said first normal position permitting closure of said second valve so as to permit the filling of the tank when said first valve is open,

operating means for said first valve controlled jointly by said float and by said handle means when said handle is in its said normal position to permit closure of said first valve when the water level in the tank reaches a first predetermined partially-filled level,



said operating means for said first valve being controlled jointly by said float and by said handle means when said handle is in its said first actuated position to close said first valve only when the water level in the tank reaches a second level higher than said first level,

and flushing means controlled by said handle means when said handle is moved to its said second actuated position to open said second valve to flush the bowl with the quantity of water then stored in the tank.

4,120,056

FLUSH TOILET ACCESSORY

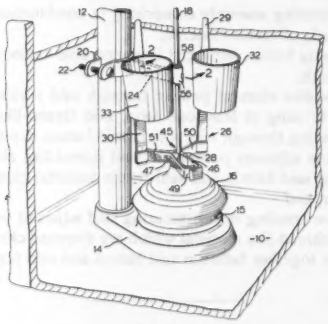
Clarence F. Phripp, R.R. #1, St. Clements, Ontario, Canada (N0B 2M0), and Norman R. Preston, 169 Ross Ave., Kitchener, Ontario, Canada (N2A 1V5)

Continuation-in-part of Ser. No. 615,923, Sep. 23, 1975, Pat. No. 4,032,997. This application May 11, 1977, Ser. No. 797,809

Claims priority, application United Kingdom, Sep. 30, 1974, 42437/74

Int. Cl.[2] E03D *1/14*

U.S. Cl. 4—324 **9 Claims**



1. A flush regulator for use in a toilet flush tank for regulating the outflow therefrom through an outlet pipe, the toilet flush tank including a hollow ball valve adapted to stop up the outlet pipe, a vertical stem with its lower end attached to the ball valve and its upper end adapted to be pulled up to initiate a flush, and a bracket extending laterally from an overflow pipe within the tank and having a vertical bore through which the stem passes, the regulator comprising:

gripping means for gripping the vertical stem,

two upright post members supported from said gripping means, the post members being spaced from the stem and from each other,

and two upwardly open cup members capable of containing water mounted respectively to the post members, each cup member being wholly to one side of its respective post member and positioned such that rotation of the regulator in one direction with respect to the bracket will bring one of the post members into contact with the bracket, and rotation of the regulator in the other direction with respect to the bracket will bring the other post members into contact with the bracket, thereby preventing contact or catching of a cup member under or against the bracket.

4,120,057

ELECTROMECHANICAL ADJUSTING DEVICE

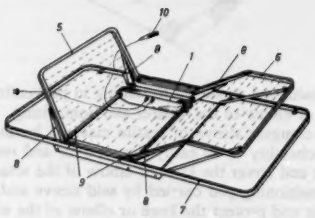
Gernot Neumann, Lippereihe, Fed. Rep. of Germany, assignor to Hanning Elektro-Werke Robert Hanning, Bielefeld, Fed. Rep. of Germany

Filed May 17, 1977, Ser. No. 797,629

Claims priority, application Fed. Rep. of Germany, May 21, 1976, 2622783

Int. Cl.[2] A47B *83/04;* A61G *7/10;* F16D *67/02*

U.S. Cl. 5—66 **7 Claims**



1. An electromechanical adjusting device for pivotable head and/or foot parts of a bed frame with a pivot in the form of a rod movable with the pivotable part and extending transversely of said bed frame, said adjusting device comprising a reversable rotary electric motor, a reduction gear for said electric motor, free wheeling spring clutch means in said reduction gear arranged to allow slip motion of said rod in a direction to raise said pivotable part, an insulative protective casing for said adjusting device and means for supporting said adjusting device on said rod.

4,120,058

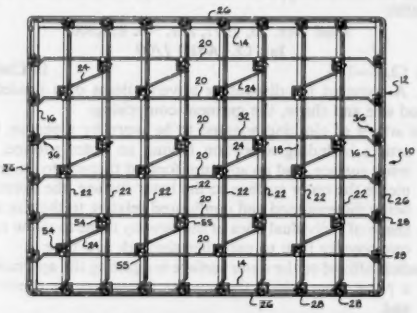
LOW PROFILE BOX SPRING ASSEMBLY

John P. Kitchen, Georgetown, Ky., and Jack C. Mandusky, Adrian, Mich., assignors to Hoover Universal, Inc., Saline, Mich.

Filed Aug. 15, 1977, Ser. No. 824,347

Int. Cl.[2] A47C *23/02*

U.S. Cl. 5—247 **2 Claims**



1. In a formed wire box spring assembly which includes a

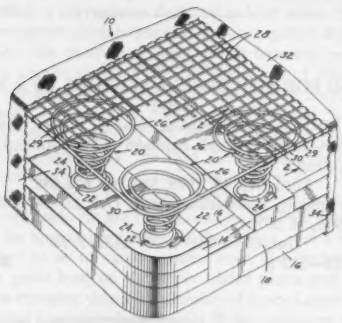
horizontally disposed generally rectangular frame and a plurality of formed wire springs mounted on said frame and extending upwardly therefrom, each of said springs comprising a unitary wire body member having a generally horizontal load supporting portion and yieldable end portions depending from the ends of said load supporting portion, each of said end portions comprising three vertically spaced torsion bars and a pair of inclined connecting bars arranged in a fish-mouth formation, the bottom one of said torsion bars being positioned on said frame, a mounting foot integral with said bottom torsion bar and engaged with said frame inwardly thereof from said bottom torsion bar, the top one of said torsion bars being located at one end of said load supporting portion and being generally parallel and in vertical alignment with said lower torsion bar, the intermediate one of said torsion bars being located inwardly of said frame from said top one of said torsion bars, one of said connecting bars extending from one end of said intermediate torsion bar to the corresponding end of said upper torsion bar and the other one of said connecting bars extending from the opposite end of said intermediate torsion bar to the corresponding end of said bottom torsion bar, said intermediate torsion bar being positioned between said top and bottom torsion bars so that said one connecting bar extends upwardly and outwardly from said intermediate torsion bar and said other connecting bar extends downwardly and outwardly from said intermediate torsion bar.

4,120,059

FURNITURE SPRING ASSEMBLY AND METHOD FOR MANUFACTURE THEREOF

Paul Cavaler, 22698 Essex Way, Southfield, Mich. 48075

Filed Apr. 25, 1977, Ser. No. 790,286
Int. Cl.[2] A47C *23/02*
U.S. Cl. 5—256 **10 Claims**



1. A spring assembly for furniture comprising a plurality of substantially conical coil springs each having a spring height, means attached to ends of said springs of lesser diameter to support said springs such that spring end coils of greater diameter lie in a substantially common plane, and a mesh overlying said spring end coils of greater diameter in said substantially common plane, said end coils of greater diameter being free-floating with respect to said mesh and with respect to each other.

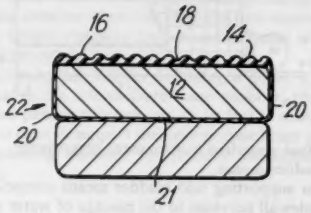
4,120,060

MATTRESS CONSTRUCTION

Richard C. Lush, 1922 E. 14 St., Brooklyn, N.Y. 11229

Continuation-in-part of Ser. No. 627,532, Dec. 31, 1975, abandoned. This application Nov. 21, 1977, Ser. No. 853,278
Int. Cl.[2] A61G *7/02*
U.S. Cl. 5—345 R **8 Claims**

1. An improved mattress construction having means for acting with a users feet at the foot end of said mattress and allowing positioning of a users toes while lying on the stomach, said means being disposed along designated locations across said mattress for transmittal of body movement through said users toes with said means, said mattress being provided with a generally planar outer ticking layer wherein said improvement comprises: said mattress being provided with means having at least one transverse row of uniformly spaced protuberances



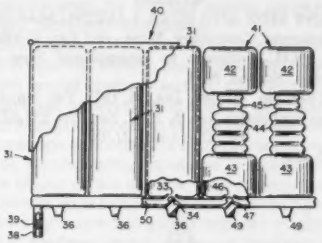
integral with said ticking across the entire width of said mattress to define means adapted to co-act with said toes, said means being disposed away from said foot end of said mattress for a distance along the length of said mattress to enable engagement of the toes of said user at surfaces formed by the protuberances.

4,120,061

PNEUMATIC MATTRESS WITH VALVED CYLINDERS OF VARIABLE DIAMETER

Harold E. Clark, 14 Beacon Hill, Fairport, N.Y. 14450

Filed Oct. 13, 1977, Ser. No. 841,658
Int. Cl.[2] A47C *27/08*
U.S. Cl. 5—350 **17 Claims**



1. A pneumatic mattress, comprising

a first plurality of flexible, hollow cells, which are similar in configuration and circular in cross section,

each of said cells comprising at least one section of relatively large diameter, and at least another section smaller in diameter than said one section and connected coaxially to said one section,

means for supporting said cells in side-by-side vertical relation with the upper ends of the uppermost of said sections disposed in coplanar relation,

said means including a flexible plenum extending completely and continuously beneath the lower ends of said cells, and each of said cells having in the lower end thereof an orifice for connecting the interior of each cell with the interior of said plenum,

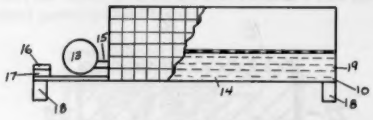
means for supplying gas under pressure to the interior of said plenum for distribution through said orifices to said cells, and

a plurality of valves in said plenum releasably insertable into said orifices for individually closing the orifices in said cells individually to trap gas under pressure in said cells, when closed, thereby to prevent return thereof to said plenum.

4,120,062
WATERBED ENVIRONMENTS

Richard P. Anderson, Albert Meadow, Bar Harbor, Me. 04689

Filed Mar. 25, 1976, Ser. No. 670,438
Int. Cl.[2] A47C 27/08
U.S. Cl. 5—370 3 Claims

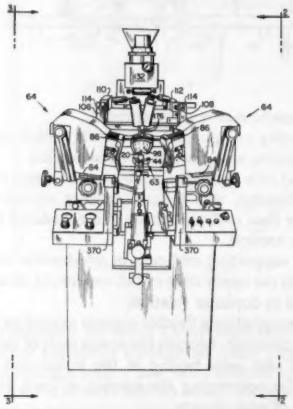


1. An infant waterbed environment comprising:
water bladder means;
means for supporting said bladder means comprising a porous sidewall pervious to the passage of water and a base of convex curvature upwards adapted to shed water away from said base in the event of a leak in the bladder;
means for displacing water contained in the bladder means at selected frequencies to provide pulsations sensible to an infant on the water bladder comprising displacement pump means and reservoir means communicating with the bladder means, said pump coupled with said reservoir for displacing water into the bladder from the reservoir and withdrawing water from the bladder into the reservoir at selected frequencies thereby providing pulsations of rushing water in the bladder means and consequently a sensible and audible environment which recreates aspects of the intrauterine environment;
and means for adjusting the frequency of the pulsations produced by said displacement pump.

4,120,063
CEMENT SIDE AND HEEL LASTING MACHINE

Walter Vornberger, Tewksbury, Mass., and Karl F. Vornberger, Amherst, N.H., assignors to International Shoe Machine Corporation, Nashua, N.H.

Division of Ser. No. 762,685, Jan. 26, 1977, Pat. No. 4,082,060.
This application Sep. 6, 1977, Ser. No. 831,039
Int. Cl.[2] A43D 21/00
U.S. Cl. 12—12 2 Claims

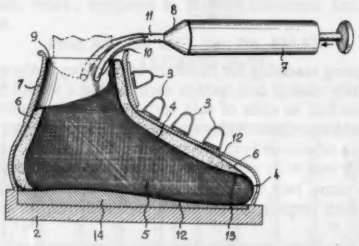


1. A side and heel lasting machine, operable on a shoe assembly formed of a last having an insole located on its bottom and an upper mounted thereon, comprising: a shoe assembly support for supporting the shoe assembly bottom-up with the toe end of the shoe assembly facing forwardly and with the side and heel portions of the upper margin extending upwardly of the insole; a slide plate, located rearwardly of the support, mounted for forward-rearward movement; heel wiping means mounted to the slide plate for forward movement with respect to the slide plate in a heel wiping stroke from a retracted position wherein the heel wiping means is in a position in readiness for wiping to an advanced position wherein the heel wiping means has wiped the heel portion of the upper margin against the corresponding portion of the insole periphery; a shoe assembly engaging member mounted to the slide plate below the heel wiping means; a side wiping means located on each side of the support, each side wiping means being mounted for inward movement from a position of disengagement with the shoe assembly through a side wiping stroke to an inner position wherein the side wiping means has wiped a side portion of the upper margin against a corresponding portion of the insole periphery; means for initially maintaining the slide plate in a rearward position; means for initially maintaining the heel wiping means in its retracted position; means for thereafter moving the slide plate forwardly until the shoe assembly engaging member engages the heel end extremity of the shoe assembly; means for thereafter imparting a heel wiping stroke to the heel wiping means; means for initially maintaining each side wiping means in its position of disengagement; and means for thereafter imparting a side wiping stroke to each side wiping means; the machine having the improvement comprising: means mounting each side wiping means for forward-rearward movement; and connecting means so connecting each side wiping means to the slide plate as to cause forward movement of the side wiping means concomitantly with said forward movement of the slide plate whereby the heel wiping stroke and the side wiping strokes may be performed simultaneously regardless of the position of engagement of the shoe assembly engaging member with the heel end extremity of the shoe assembly.

4,120,064
METHOD FOR ADJUSTING A SKI-BOOT TO A SKIER'S FOOT

Georges Pierre Joseph Salomon, Annecy, France, assignor to Etablissements Francois Salomon et Fils, Annecy, Haute-Savoie, France

Filed Oct. 15, 1975, Ser. No. 622,688
Claims priority, application France, Oct. 15, 1974, 74 34643; Oct. 8, 1975, 75 30799
Int. Cl.[2] A43D 9/00; A43B 7/14
U.S. Cl. 12—142 R 26 Claims

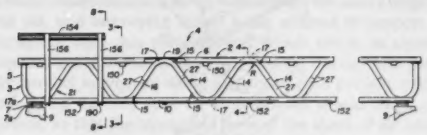


1. A method for adjusting a ski boot including an outer shell, a sole and a slipper located inside said shell and providing at least one cavity between said shell and the foot, comprising: placing the foot to which the boot is to be fitted in the slipper, filling the cavity with a mixture of products solved in at least one volatile product, said mixture being in a stable viscous state; and eliminating the at least one volatile product by causing said volatile product to escape at the atmosphere into a gaseous phase until hardening of the mixture of products.

4,120,065
LIGHTWEIGHT MODULAR, TRUSS-DECK BRIDGE SYSTEM

Eugene W. Sivachenko, 6471 Riverside Dr., Redding, Calif. 96001; Firoze H. Broacha, Lakewood, Colo., and Artemas M. Larkin, Redding, Calif., assignors to Eugene W. Sivachenko, Redding, Calif.

Filed Dec. 15, 1977, Ser. No. 860,796
Int. Cl.[2] E01D *15/00*
U.S. Cl. 14—6 **71 Claims**



55. A lightweight high efficiency modular bridge constructed of a plurality of pre-assembled bridge modules, the bridge comprising: a plurality of longitudinally extending, side-by-side modules, each module having a width less than about 48 inches, spaced apart upper and lower chord plates, and a chord plate connecting sinusoidal support structure alternatingly connected to the upper and the lower chord plates, the support structure having a web-like configuration defined by serially arranged center sections and upper and lower crown portions connected with the center sections, the support structure further having a width substantially equal to the width of the chord plates; means for fastening the crown portions to the chord plates over substantially their full width; the chord plates and the support being constructed of corrugated metal plate defining longitudinally running corrugations, the corrugations of the chord plates and of the support nesting in each other, the corrugations further having a trapezoidal cross-section, a corrugation depth of at least about 5¼ inches and a corrugation pitch larger than the corrugation depth; load distribution ribs positioned intermediate fastening points between the crown portions and the upper chord plate, being oriented perpendicular to the upper chord plate corrugations, and having a width so as to contact all modules of the bridge; means for rigidly securing the load distribution ribs to the upper chord plates only; the load distribution ribs having a section modulus which is sufficiently large so that vehicular point loads applied to the upper chord plate in the vicinity of a load distribution rib are transferred by the load distribution rib onto the upper chord plates of the bridge over a width of several feet so as to cause a more even distribution of the vehicular point load on the upper chord plates and thereby reduce the stressing thereof; a plurality of spaced apart upright posts located proximate lateral sides of the outermost modules of the bridge; means rigidly connecting the posts with each of the upper and the lower chord plates so that a portion of the post protrudes above the upper chord plate; a guard rail extending over the length of the bridge and secured to the protruding portions of the upright posts to define lateral safety barriers for the bridge; and a road bed placed on top of the upper chord plate to define a surface on which vehicular traffic can move.

4,120,066
EXPANSION JOINT FOR ROADWAY SECTIONS

Yves Gerald Leroux, 8790 Terrasse Forget, La Salle, Quebec, Canada

Filed Jun. 1, 1977, Ser. No. 802,497
Int. Cl.[2] E01D *19/06*
U.S. Cl. 14—16.5 **18 Claims**

1. An expansion joint for adjacent first and second roadway sections having a gap therebetween to allow expansion of said sections, the joint comprising:

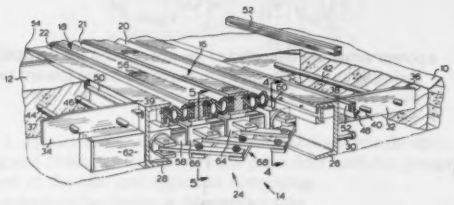
at least one intermediate beam member in said gap and extending along at least a substantial portion of the width of the roadway sections;

resilient sealing means located in and closing gaps between said intermediate beam member and the roadway sections, substantially to seal the roadway surface across the gap;

a plurality of joint units in spaced apart relationship across the width of the roadway sections, each said joint unit extending from the first roadway section to the second roadway section across the gap, and including:

a spanning member extending from the first roadway section to the second roadway section and movable with respect to at least one of said roadway sections;

each said joint unit further including a glider box, fixedly secured to the intermediate beam member, the spanning member passing through said glider box in sliding relation thereto so as to support the intermediate beam member on the spanning member for relative movement therebetween;



each joint unit further including means for substantially maintaining a predetermined ratio of distance between the first roadway section edge and the intermediate beam member, to that between the second roadway section edge and the intermediate beam member, when the size of the gap between the first and second roadway sections changes, said means comprising:

a sectionally expandable and contractable device secured to the first roadway section, the intermediate beam member and the second roadway section, said device having expandable and contractable sections between said securings which expand and contract in the direction across the gap, the expansion or contraction of one of said device sections causing corresponding expansion or contraction of the others of said device sections, in predetermined relationship thereto, so as to move the intermediate beam member transversely across said gap in response to movement of the first roadway section or second roadway section to vary the size of said gap.

4,120,067
ARTICULATED CLOSURE FOR A PASSENGER LOADING BRIDGE

George D. Hone, Roy; Kenneth L. Noall, and Robert L. Saunders, both of Ogden, all of Utah, assignors to Abex Corporation, New York, N.Y.

Filed Mar. 15, 1978, Ser. No. 886,975
Int. Cl.[2] B65G *69/24*
U.S. Cl. 14—71.5 **10 Claims**

1. A closure for a cab which connects a passenger loading bridge to an aircraft, the closure having a platform, a flexible frame including a pair of flexible spaced uprights interconnected at their upper ends by a flexible transverse member, a curtain connecting the frame to the cab, and drive means for moving the frame toward and away from the cab, characterized by:

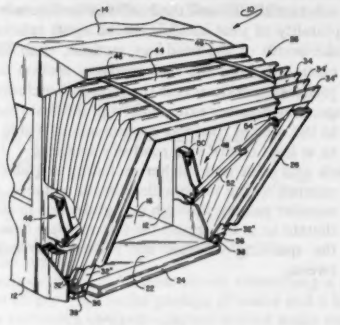
fist pivot means pivoting the lower ends of the frame uprights to the platform to enable lateral swinging movement and

the drive means including

an extensible arm assembly comprising inward and outward arms;

second pivot means pivoting the inward arm to the cab to enable vertical and lateral movement,

a flexible joint connecting the outward arm to the frame and



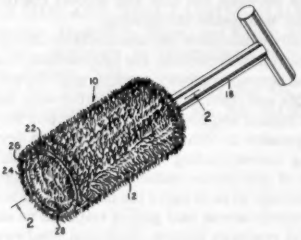
a power actuator connected to the inward arm for vertically swinging the arm assembly to move the frame toward and away from the cab.

4,120,068

RALLY WHEEL CLEANING IMPLEMENT

Philip Michael Kaczmarek, 11313 Grandville, Detroit, Mich. 48228

Filed Apr. 18, 1977, Ser. No. 788,629
Int. Cl.[2] A46B *5/00, 9/00, 15/00*
U.S. Cl. 15—160 **3 Claims**



1. A cleaning brush for cleaning recessed lug nuts on the wheel of a vehicle comprising:

a generally thin-walled hollow cylinder having front and rear edge surfaces, an outer surface and an inner surface;

a partition wall extending generally normal to the central longitudinal axis of said cylinder;

a elongated handle fixed to said partition wall having a first end extending in a direction generally coincident with the longitudinal axis of said cylinder and a head fixedly connected to said first end;

a plurality of brush bustles extending outwardly from said outer surface along substantially the entire surface thereof in a direction generally normal to the longitudinal axis of said cylinder;

a plurality of brush bristles extending inwardly from said inner surface toward the central longitudinal axis of said cylinder along substantially the entire surface thereof in a direction generally normal to the longitudinal axis of said cylinder; and

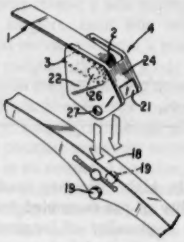
a plurality of brush bristles extending from both of said edge surfaces and outwardly therefrom in a direction generally parallel to the central longitudinal axis of said cylinder.

4,120,069

ADAPTER FOR COUPLING WINDSHIELD WIPER BLADE HOLDER WITH HOOKED WIPER ARM

Bernard C. Sharp, White Plains, N.Y., and John T. Petrik, Newtown, Conn., assignors to Parker-Hannifin Corporation, Shelton, Conn.

Filed Apr. 20, 1977, Ser. No. 789,233
Int. Cl.[2] B60S *1/40*
U.S. Cl. 15—250.32 **7 Claims**



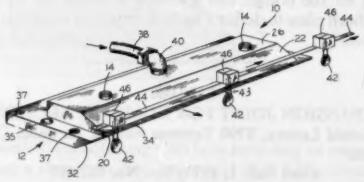
1. An adapter for connecting a wiper blade holder with a windshield wiper arm that terminates in a hook having a finger turned back along the arm, comprising a unitary molded body of resilient material forming two similarly shaped side panels and a front wall and a cross shaft which join together respective forward upper portions of said panels and hold the upper portions of said panels spaced apart to receive said hook between them, said panels having on lower portions thereof elements to mate with and to couple said body to coupling elements on a central portion of said blade holder, said front wall and said cross shaft being spaced apart longitudinally of said panels and disposed relative to said lower portions and to backward upper portions of said panels so that said body apart from the blade holder can be held in a posture in which the space between said shaft and said wall will be aligned with the finger of said hook, whereupon said finger can be passed through said space to engage said shaft pivotably in said hook, said lower portions and said backward upper portions of said panels having between them unobstructed space slightly wider than said hook and through which said hook when engaged with said shaft is free to turn upon an ensuing turning of said body about the axis of said shaft to a position for mating said coupling elements, whereby upon such turning said hook will be captured transversely by said shaft, longitudinally between said shaft and said front wall and laterally between the upper portions of said panels.

4,120,070

CLEANING SYSTEM

Hubert J. Severin, 18 Beacon Rd., Bethany, Conn. 06525

Continuation-in-part of Ser. No. 600,638, Jul. 31, 1975, abandoned. This application Feb. 10, 1977, Ser. No. 767,578
Int. Cl.[2] B08B *5/02*
U.S. Cl. 15—306 B **6 Claims**



1. A system for cleaning, with air, relatively thin parts of workpieces, comprising: an air knife, comprised of a body having an outer edge portion, and an internal chamber with an inlet thereinto and an outlet therefrom, said inlet being adapted to receive air under pressure from a source thereof, and said

outlet being comprised of a multiplicity of side-by-side, closely-adjacent channels extending from said chamber each channel ending in an orifice opening at said outer edge portion of said body, said orifices thereby cooperatively providing a substantially continuous slit therealong elongated in a predetermined direction, so that air charged under pressure into said chamber may issue from said slit as a sheet in streamline flow; and means for conveying a plurality of workpieces in succession along a travel path which includes a portion extending closely adjacent to said slit of said air knife and generally parallel to said predetermined direction along substantially the entire length of said slit, said conveying means being adapted to support the workpiece with thin parts thereof, which are to be cleaned, disposed generally transversely of said slit during their generally parallel movement along said travel path portion, said air knife being the only such air knife present at said travel path portion, so that the streamline flow of the sheet of air issuing from said slit of said air knife is not unduly disturbed and may impinge upon the thin parts of the workpieces to effect cleaning thereof along well-defined margins.

4,120,071

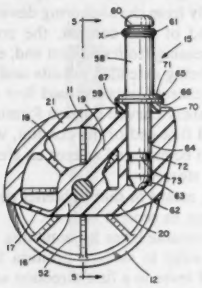
DUAL WHEEL CASTER

Donald C. Crescenzi, Branford, Conn., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed May 17, 1976, Ser. No. 686,732

Int. Cl.[2] B60B *33/00*

U.S. Cl. 16—37 **3 Claims**



1. A caster assembly, comprising; a horn for supporting a wheel, a generally vertical bore in said horn extending from an upper surface of the horn and terminating within the horn to form a rounded lower thrust surface in the horn, a bearing surface on the upper surface of the horn, a vertical pintle in the horn bore having an integral upper flange having a diameter substantially greater than the diameter of the bore, said flange having a flat lower surface engaging the bearing surface on the horn to transmit downward axial thrust load between the horn and the pintle, said pintle having an integral rounded end at the bottom thereof defining a lower thrust bearing surface, said pintle being sufficiently long so that the lower thrust bearing surface engages the rounded lower thrust surface on the horn to transmit downward axial thrust load betweem the horn and the pintle.

4,120,072

COMBINED SUPPORTING ROLLER-FRICTION DRIVE ARRANGEMENT FOR OVERHEAD SINGLE-PANEL DOORS

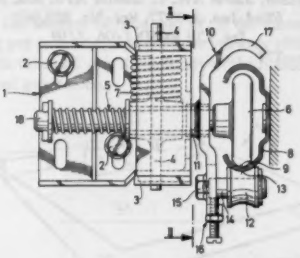
Michael Hormann, Steinhagen, Germany, assignor to Hormann KG Amshausen, Germany

Filed Aug. 23, 1977, Ser. No. 827,092

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1976, 7626729

Int. Cl.[2] E05D *13/02*

U.S. Cl. 16—87 R **10 Claims**



1. Apparatus for supporting and frictionally drivingly opening and closing an overhead single-panel door such as a garage door or the like; said apparatus comprising:

a drive roller having a drive roller axle;

drive roller support means for rotatably supporting said drive roller at a door with said drive roller axle disposed to be rotatably driven by driving means;

a relatively fixed guide track frictionally drivingly engageable with said drive roller along one side thereof;

a bearing bracket rotatably supported at said drive roller axle, and

a pair of counterpressure rollers rotatably supported at said bearing bracket and being engageable with a side of said guide track opposite said one side at respective positions of the guide track spaced from one another in the direction of travel of the drive roller, whereby said counterpressure rollers assist in assuring continuous frictional driving contact of said drive roller and said guide track.

4,120,073

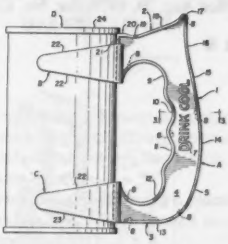
DETACHABLE HOLDER FOR BEVERAGE CANS

Robert L. Studebaker, 5732 S. Evanston Pl., Tulsa, Okla. 74105

Filed Mar. 24, 1977, Ser. No. 781,038

Int. Cl.[2] A45J *45/07*; B65D *23/10, 25/28*

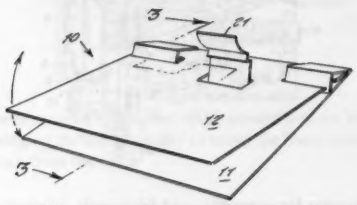
U.S. Cl. 16—114 R **3 Claims**



1. A one-piece detachable holder for beverage cans integrally molded of a plastic material comprising a substantially U-shaped hand gripping portion including upper and lower legs, a resilient arcuate can engaging clip extending from each leg and each encompassing the can outer surface more than 180° about an arcuate inner clip radius substantially equal but

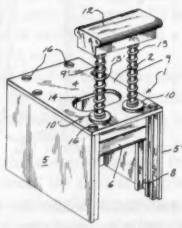
slightly less than the outer radius of a can to be held, said upper leg having an integral upstanding shoulder surface about its associated clip for engagement of the can outer surface beneath an external flange on a can to be held and extending downwards to merge with the upper surface of the clip for engaging the outer surface of said cans therewith over a vertical surface extending from said shoulder surface downwardly through the can engaging clip.

4,120,074
SNAP-LOCKING HINGE
David A. Haber, 320-B Ave. C, Gunter AFS, Ala. 36115
Filed Jun. 3, 1977, Ser. No. 803,062
Int. Cl.[2] E05D *1/06, 7/10*
U.S. Cl. 16—171 **2 Claims**



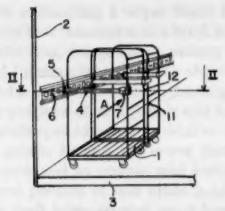
1. A snap-locking hinge, comprising in combination, a top hinge plate and a bottom hinge plate, said top hinge plate having a central opening and a slot on each opposite side edge, and said bottom hinge plate having hinge guides engaging such slots and a snap member engaging said central opening; said snap-locking member including a shoulder engaging an edge of said central opening when said top hinge plate is in a fully opened position; and snap-locking member additionally including a notch engaging said central opening edge when said top plate is in a partly closed position; said snap-locking member including a second notch engaging said central opening edge when said top plate is in a closed position; and spring means on said top plate allowing sliding of said plate laterally respective to said bottom plate, for disengaging said opening edge from said snap-lock member, said spring means comprising a struck-out notch on each said opposite side edge of said top plate, thus forming a narrow, resilient spring finger, that is located beyond a top plate end edge, about which said top plate pivots within said hinge guide, so that lateral sliding of said top plate thus forces said spring finger to move toward said end edge, in order to provide said disengagement.

4,120,075
HUMANE SACRIFICER
William B. Rypstat, 909 Ethel St., Wausau, Wis. 54401
Filed Aug. 29, 1977, Ser. No. 828,387
Int. Cl.[2] A22B *3/00*
U.S. Cl. 17—1 R **4 Claims**



1. A sacrificer for humanely killing an animal includes a housing for receiving at least the head and neck region of said animal, said housing having an end wall, a top wall, a pair of side walls and a blade adapted for reciprocal movement positioned in the housing at the opposite end from the end wall; said end wall having a viewing area therein so that when the animal is properly orientated in the housing to face the end wall it can see through the viewing area to the outside and said top wall having a viewing area therein so that it can be determined from outside the housing if the animal is properly orientated in the housing so that the animal will be struck a killing blow in the head or neck region by moving the blade forcibly downward.

4,120,076
SYSTEM EMPLOYING A STRAP FOR STOWING CONTAINERS AGAINST A WALL
Charles Jean-Pierre Lebre, 35, rue de l'Orangerie, 91700 Ste Genevieve des Bois, France
Filed Apr. 7, 1977, Ser. No. 785,678
Claims priority, application France, Apr. 13, 1976, 76 10763
Int. Cl.[2] A44B *21/00*
U.S. Cl. 24—68 CD **4 Claims**



1. A system for stowing roll-containers against a wall, comprising a strap, an anchoring device for fastening a first end of the strap on the wall, and a tightener device engaging the strap adjacent its second end, said tightener device comprising:

a tubular casing comprising two parallel faces and two sides which connect said faces and form therewith a tubular conduit through which said strap extends, the strap extending freely from the anchoring device into the entrance at a first end of said conduit, the cross-section of said conduit increasing from said first end, each of said sides of said casing being extended outside said conduit and at the second end thereof opposite said first end of the conduit by an outwardly curved portion forming a hook directed towards said first end of the conduit, whereby each hook is adapted to be engaged against an element of a roll-container to be stowed;

self-tightening means in said tightener device engaging said strap adjacent its second end;

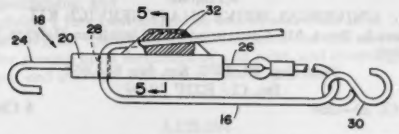
a tensioning rotatable lever for actuating said self-tightening means, the strap in stowed position being tightened by rotating said lever in a first direction and said lever being constituted at least in two parts movable with respect to each other, one of said parts comprising the free end of the lever and being retractable after the strap has been tightened; and

locking means for holding the strap under tension after tightening thereof.

4,120,077
TIE-DOWN TENSIONING DEVICE
William F. Fink, Novato, Calif., assignor to Roberton & Schwartz, San Francisco, Calif.
Filed May 9, 1977, Ser. No. 795,298
Int. Cl. F16G *11/04*
U.S. Cl. 24—130 **8 Claims**

1. A tie-down tensioning device comprising a rigid body of cast polycarbonate plastic defining an elongated open-ended, open top channel, said channel tapering from minimum trans-

verse dimensions at the bottom thereof to larger transverse dimensions at the open top thereof, said body having a metallic rod formed into a generally U-shape planar figure rigidly fixed thereto and projecting therefrom to provide attachment means at the opposite ends of said channel with the bottom of said U-shape projecting from said body at one end of said channel and the free ends of the legs thereof projecting from said body



at the other end of said channel and being formed to provide a hook means, and an opening through said body at one end of said channel having cross-sectional dimensions larger than said minimum transverse dimensions of said channel at the bottom thereof, the sides of said channel each being grooved to provide a plurality of elongated ridges extending from the bottom of said channel to the top of said channel inclined away from said opening.

4,120,078

SIMULTANEOUS TEXTURIZING AND ENTANGLING OF FILAMENT BUNDLES

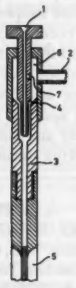
Wolfgang Martin, Ludwigshafen; Wolfgang Bauer, Heidelberg; Dieter Herion, Frankenthal; Hermann Linge, Carlsberg, and Hans Knopp, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 22, 1976, Ser. No. 753,413

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 2558481; Jul. 19, 1976, 2632384

Int. Cl.[2] **D02G** *1/16, 3/34;* **D02J** *1/06*

U.S. Cl. 28—252 **6 Claims**



1. A process for the manufacture of texturized and entangled filament bundles from drawn or partially drawn filaments of synthetic high molecular weight materials, by passing said filaments, by means of a heated fluid, through a tubular first treatment zone, and thereafter through a second tubular treatment zone from which the fluid can escape radially through slots running in the lengthwise direction, wherein, on bringing together the heated fluid with the filament bundle to be treated, at the inlet to the first treatment zone, the flow velocity of the fluid is left substantially unchanged, and in the first treatment zone a volume mass flow factor

$$VM = \frac{G_{fl} + G_{gl}}{V_l}$$

of from 50 to 150 kg/m per m^3 is maintained, in which formula V_l is the volume of the filament guide tube expressed in units of length and G_{fl} is defined as

$$G_{fl} = G'_l \times \frac{1}{w_l}$$

and Gg_l is defined as

$$G'_g \times \frac{1}{w_g},$$

where G'_l is the amount of fluid and G'_g is the amount of filament passing per unit time, w_l is the flow velocity of fluid in the filament guide tube and w_g is the velocity of the filament bundle in the filament guide tube.

4,120,079

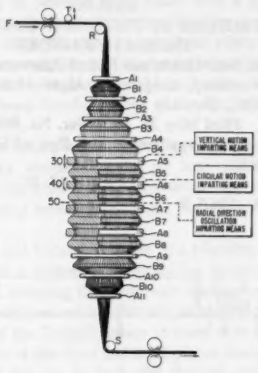
TOW OPENING APPARATUS

Masataka Yamaguchi; Saeko Yamaguchi, and Tadashi Ohokubo, all of Tokyo, Japan, assignors to Tokyo Institute of Technology, Tokyo, Japan

Filed Oct. 11, 1977, Ser. No. 841,129

Int. Cl.[2] **D01D** *11/02*

U.S. Cl. 28—282 **5 Claims**



1. A filamentary tow opening apparatus, comprising:

a plurality of opening rings each having a plurality of small protrusions or ridges and valleys formed on the interior peripheral surfaces thereof,

a plurality of opening disks each having a plurality of small protrusions or ridges and valleys formed on the exterior peripheral surfaces thereof,

said plurality of opening rings and said plurality of opening disks being alternately disposed and vertically spaced apart from each other by a suitable distance, and

means for feeding tow filaments to, and discharging said filaments from, said plurality of rings and disks in alternate contact with the interior peripheral surfaces of said opening rings and the exterior peripheral surfaces of said opening disks, whereby said tow filaments are opened.

4,120,080

METHOD OF MANUFACTURING GRID ELECTRODES FOR ELECTRON TUBES

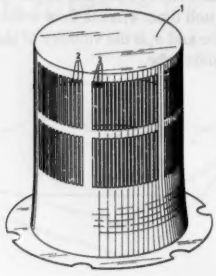
Johannes Wilhelmus Antonius Krol, Eindhoven, Netherlands; Bernhard Lersmacher, Aachen, and Horst Seifert, Hamburg, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 10, 1977, Ser. No. 776,254

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1976, 2613170

Int. Cl.[2] H01J *9/14*

U.S. Cl. 29—25.18 10 Claims



1. A method of manufacturing grid electrodes for electron tubes comprising the steps of depositing pyrolytic graphite by thermal decomposition of a carbonaceous gas on a mandril thereby to form a moulded body, separating the moulded body thus formed from the mandril, providing said body with grid-like apertures, and annealing said body at a temperature of 700° to 1200° C. for less than three minutes in an oxygen containing atmosphere.

4,120,081

MANUFACTURE OF PISTONS INCORPORATING A THERMAL BARRIER

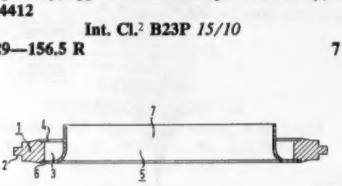
Fritz Rösch, Schwabach, and Rudolf Zimmermann, Nuremberg, both of Germany, assignors to Alcan Aluminiumwerk Nürnberg GmbH, Germany

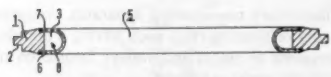
Filed May 26, 1977, Ser. No. 800,880

Claims priority, application Fed. Rep. of Germany, May 31, 1976, 2624412

Int. Cl.[2] B23P *15/10*

U.S. Cl. 29—156.5 R 7 Claims





1. A method of producing a piston comprising

(a) forming a piston ring carrier insert by

(i) forming an annular steel member, having two opposite circumferentially extending edges, to be channel-shaped in radial cross-section, the channel facing radially outward, and

(ii) securing said opposite circumferentially extending edges of said annular member to axially opposite radially-inner inner edge portions respectively of an annular ferrous metal piston ring carrier body whereby an enclosed annular space is formed between the body and the annular member,

(b) treating the assembled insert to form an iron/aluminium alloy at the external surface of the insert,

(c) placing the treated assembled insert in a piston mould and

(d) casting aluminium in the mould to form the piston.

4,120,082

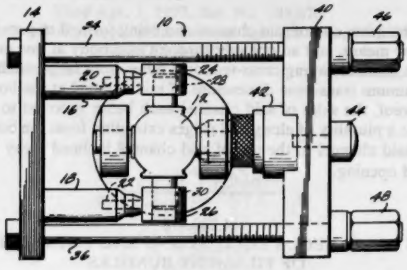
UNIVERSAL DRIVE SHAFT SERVICE KIT

William L. Bond, 510 Greenwood Rd., Linthicum Heights, Md. 21090

Filed Sep. 19, 1977, Ser. No. 834,662

Int. Cl.[2] B23P *19/04*

U.S. Cl. 29—254 6 Claims



1. A tool for removing bearings having a nylon locking ring from the yoke of a constant velocity universal drive shaft without damaging the yoke comprising:

a stud support member;

a pair of yoke supports extending upwardly from said stud support member at separated locations to engage said yoke;

a pair of rods extending upwardly from said stud support member outside said yoke supports, and threaded on the end opposite said stud support member;

a top member having bores through which said rods extend;

means mounted on said top member for engaging said yoke about a bearing, and for receiving said bearing; and

thrust means engaging said threads on each said rod for applying a force to said top member to cause said nylon locking ring to shear and said bearing to move into said engaging and receiving means.

4,120,083

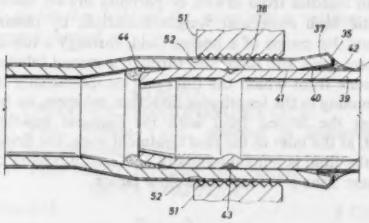
METHOD OF PIPE JOINING

Marvin C. Echols, Houston, Tex., assignor to Zap-Lok Systems International, Inc., Houston, Tex.

Filed Dec. 6, 1976, Ser. No. 747,726

Int. Cl.[2] B23P *3/00, 25/00*

U.S. Cl. 29—458 7 Claims



1. In a method of forming mechanical joints between tubular elements, of the type wherein a bell is formed in an end portion

of one such element for receiving a pin end of the other element, the improvement comprising:

tapering inwardly one end of tubular member to form a pin end and enlarging one end of another tubular member to form a bell end sized to receive a pin end with an interference fit,

forming an annular groove on the exterior on a cylindrical wall portion of said pin end as near to said tapered end as practicable, and

applying a lubricant-sealant to one of said ends so as to fill the angular space between said tapered end and said annular groove upon formation of said joint, and inserting said pin end into said bell end in interference fit.

4,120,084

METHOD OF MAKING IMPROVED LUG AND HOLE CONNECTION BETWEEN SHEET METAL ELEMENTS

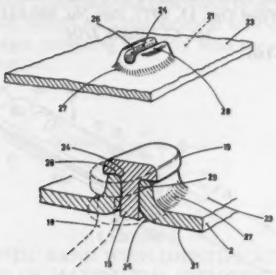
Knut Olof Lennart Wallman, Fergas AB, Oskarsgatan 10, S-582 21 Linköping, Sweden

Filed May 11, 1977, Ser. No. 795,859

Claims priority, application Sweden, May 12, 1976, 7605383

Int. Cl.[2] B23P *11/00*

U.S. Cl. 29—509 **5 Claims**



1. The method of making a permanent connection between a first sheet metal element having inner and outer surfaces and a second sheet metal element having an integral lug projecting lengthwise outwardly beyond an end edge thereon, whereby the elements are disposed substantially normal to one another with said end edge on the second element engaged along its length against the inner surface of the first element and with said lug projecting lengthwise through a hole in said first element, said method being characterized by:

A. forming the hole in the first element by

(1) applying outward force to the inner surface of said first element along a line segment having a length no greater than the width of the lug, while

(2) applying inward force to the outer surface of said first element around a circular zone circumscribing said line segment, to form the hole without removal of material from the first element, and to produce out-turned wall portions at opposite sides of the hole and a convexly rounded surface between the inner surface of each wall portion and the adjacent undeformed portion of the inner surface of the first element, and

(3) said hole being so formed that the distance between said out-turned wall portions is slightly less than the thickness of the second element;

B. so forming the second element that the lug thereon has a length greater than the projected distance from the inner surface of the first element to the outer edges of said wall portions;

C. inserting the lug into the hole in the direction from the inner towards the outer surface of the first wall element until said end edge on the second element is engaged against the inner surface of the first element; and

D. by applying substantially endwise force to the projecting end portion of the lug over substantially the entire end area thereof, forming a laterally enlarged head thereon which firmly engages the outer edges of said wall portions, but terminating the application of such endwise force before substantial reworking of said wall portions occurs.

4,120,085

BEAM TYPE PLANAR ARRAY ANTENNA METHOD OF FABRICATION

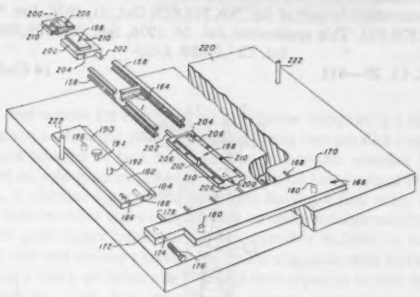
Robert K. Peterson, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 547,899, Feb. 7, 1975, Pat. No. 3,987,451.

This application Aug. 6, 1976, Ser. No. 712,425

Int. Cl.[2] H01Q *13/10*; H01P *11/00*

U.S. Cl. 29—600 **2 Claims**



1. A method of fabricating a planar array antenna comprising:

(a) configuring an antenna back plate with a plurality of series slots from a sheet of antenna forming material;

(b) configuring an antenna front plate with a plurality of shunt slots from a sheet of antenna forming material;

(c) positioning the back plate on a jig base plate;

(d) positioning a cavity templet on the jig base plate to define flanged beam bonding areas on the back plate, and coating the flanged beam bonding areas of the back plate with a bonding primer;

(e) replacing the back plate with the front plate and positioning the cavity templet on the jig base plate to define flanged bonding areas on the front plate, and coating the flanged bonding areas of the front plate with a bonding primer;

(f) coating top and bottom surfaces of a plurality of flanged members with a primer coat, attaching strips of bonding material, and inserting them through the open end of a jig along a plurality of cavity forming mandrels to position the flanges of the flanged beams to mate with the flanged bonding areas of the front and back plates, and closing the open end of the jig to lock the flanged members and mandrels into position in the frame;

(g) positioning the jig carrying the flanged beams on the jig base plate over the front plate, and positioning the back plate, with the flanged beam area facing down, over the jig carrying the flanged beams;

(h) positioning a manifold templet on the jig base plate to define the manifold bonding area on one side of the back plate, coating the manifold area of the back plate with a bond primer, and removing the manifold templet;

(i) positioning the manifold on the back plate with the open faced waveguides facing down and in alignment with the primed manifold open faced areas of the back plate;

(j) placing pressure plates within areas defined by the manifold waveguides to lock the manifold components into position;

(k) placing the jig bearing the array into a vacuum bag and

drawing a vacuum to exert a uniform force on the front and back plates;

(l) heating the bag to a bonding temperature to bond the manifold to the back plate, and the back and front plates to the flanged beams; and

(m) removing the array antenna from the jig and the mandrels from the cavities of the array antenna and attaching shorting bars to close the open ends of the cavities of the array antenna.

4,120,086

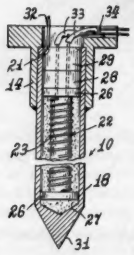
METHOD OF MAKING ELECTRICALLY HEATED NOZZLE

Walter R. Crandell, Addison, Ill., assignor to Fast Heat Element Manufacturing Co., Elmhurst, Ill.

Continuation-in-part of Ser. No. 516,618, Oct. 21, 1974, Pat. No. 3,970,821. This application Jul. 16, 1976, Ser. No. 705,996

Int. Cl.[2] H05B *3/00*

U.S. Cl. 29—611 **14 Claims**



1. The method of making an integral heated torpedo for a molding nozzle which comprises winding a wire resistor upon a core having an opening therein extending the length thereof, extending a lead wire through said opening, connecting the end of said wire resistor to said lead wire, placing a ceramic spacer at each end of said core, inserting the core and spacers unsheathed into the open bore of a casing comprising a torpedo body closed at one end, filling the bore with heat transfer electrical insulation material to fill all voids in said bore between said core and spacers and said casing, placing an insulated washer in the open end of the bore, swaging the casing to reduce the diameter thereof and to pack the insulation material tightly around the core and in all gaps in the bore, and shaping the closed end of the casing.

4,120,087

METHOD OF SECURING A BATTERY TERMINAL TO AN EXTERNAL WALL

Keith John Bruce McEwan, Solihull, England, assignor to Joseph Lucas (Batteries) Limited, Birmingham, England

Continuation of Ser. No. 514,941, Oct. 15, 1974, abandoned, which is a division of Ser. No. 336,711, Feb. 28, 1973, abandoned. This application Sep. 17, 1976, Ser. No. 724,458

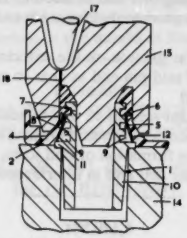
Int. Cl.[2] H01M *2/16*

U.S. Cl. 29—623.2 **3 Claims**

1. A method of securing a battery terminal bushing to an external wall of an electric storage battery, said external wall being formed of a synthetic thermo plastic material, said method including the steps of:

locating one end of the terminal busing in an aperture in said external wall, there being a clearance between the bushing and said wall, said wall including an integral annular ridge extending around said aperture;

partially melting said integral annular ridge adjacent to said molten filler material by injection molding a molten synthetic plastic filler material into said clearance; and



allowing said filler material to cool and solidify forming a liquid-tight joint between said filler material and said integral annular ridge.

4,120,088

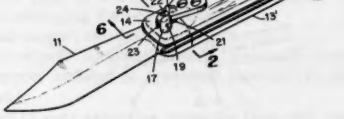
KEY-LOCK KNIFE

Paul S. Phelps, 1306 Woodlawn Dr., Maryville, Tenn. 37801

Filed Oct. 11, 1977, Ser. No. 840,611

Int. Cl.[2] B26B *1/04*

U.S. Cl. 30—160 **3 Claims**



1. An improved knife of the type wherein a blade is secured to a rotatable blade pivot passing transversely through a knife handle, and a turning key is connected to said blade pivot exterior to said knife handle with a second pivot whereby said blade may be moved from a position within said knife handle to an extended position substantially aligned with said knife handle, the improvement which comprises:

said blade pivot being provided with an axial bore, said bore having a closure at an end opposite said turning key;

a detent element mounted coaxially within said bore, wherein said detent element comprises a helical spring within said bore in contact with said closure and a spherical ball at a second end of said bore in contact with said spring; and

a cylindrical end surface on said turning key having an axis coexistent with an axis of said second pivot, said cylindrical surface being provided with a plurality of semispherical depressions to receive a portion of said spherical ball in specific pivoted positions of said turning key about the axis of said second pivot.

4,120,089

VEGETABLE AND FRUIT-SLICING UTENSILS

Alfred Börner, Pickliessemer Str. 3, 5521 Dudeldorf, Fed. Rep. of Germany

Filed Mar. 17, 1977, Ser. No. 778,597

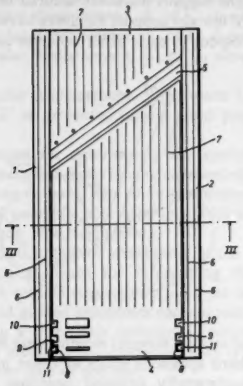
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1976, 2611879; Mar. 24, 1976, 2612362

Int. Cl.[2] B26B *3/00*

U.S. Cl. 30—278 **20 Claims**

1. In a kitchen utensil for cutting vegetables, fruit and the like into portions such as slices, such utensil including two opposite rails, a back plate carried by the rails, a removable

front plate between the rails having a surface generally parallel to and spaced from a surface of the back plate and a slicing blade between the two plates having a cutting edge at least part of which lies in the same plane as a surface of the back plate,



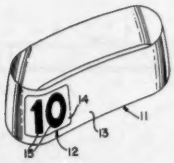
the improvement comprising the removable front plate having on its underside bearers each containing at least one step, and supporting ledges projecting inwardly from the rails for supporting said bearers.

4,120,090

ORTHODONTIC BAND WITH IDENTIFICATION AND METHOD OF MAKING THE IDENTIFICATION

Peter C. Kesling, Green Acres, LaPorte, Ind. 46350

Continuation-in-part of Ser. No. 628,332, Nov. 3, 1975, abandoned. This application Mar. 15, 1977, Ser. No. 777,667
Int. Cl.[2] A61C *13/22*
U.S. Cl. 32—14 A **1 Claim**



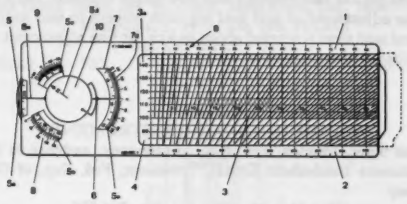
1. The method of making easy-to-read identification for a stainless steel preformed orthodontic band having a highly polished exterior surface, comprising the steps of applying a first coating of non-toxic material of one color onto the exterior surface and over substantially the entire width of the band at one area along the band which at least visually dulls the polished surface, and applying a second coating of non-toxic substantially opaque material of a contrasting color onto and over substantially the entire surface of said first coating in the form of a selected indicia to permit easy identification of the band type and/or size, said steps of applying said coatings including printing of the first coating onto the band, curing the coating by subjecting it to about 300° F. for about 15 minutes, printing of the second coating onto the cured first coating, and curing the second coating by subjecting it to about 300° F. for about 15 minutes.

4,120,091

DEVICE FOR ESTIMATED AIR NAVIGATION, OBTAINED THROUGH THE COMBINATION OF VARIOUS MEASURING AND CALCULATING INSTRUMENTS

Augusto Borgato, Via Casalini 5, Rovigo, Italy (45100)

Filed Dec. 3, 1976, Ser. No. 747,157
Claims priority, application Italy, Dec. 29, 1975, 64509 A/75
Int. Cl.[2] G01C *21/20*
U.S. Cl. 33—15 B **13 Claims**



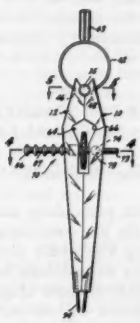
1. Instrument for estimated air navigation comprising a base member, scalimetric rulers extending along two parallel longitudinal borders of said base member, a rotatable member located on said base member inwardly of said longitudinal borders, a circular logarithmic slide rule having a first scale on said base member and a second scale on said rotatable member, a first goniometer connected to the rotatable member of said slide rule and having a marking which is alignable with meridians on a chart, an index mark on said base adjacent to said first goniometer, said first goniometer having course-indicating markings adjacent to and alignable with said index mark, said first goniometer being transparent and rotatable with the rotatable member to align the marking with meridians on a chart, a chronometric nomograph on said base member in spaced relation to said first goniometer, a polar grating on said base member, a slider mounted on said base member for translatory movement thereon and a second goniometer supported by and rotatable on said slider, said second goniometer being transparent and having scales thereon overlying said polar grating.

4,120,092

PLASTIC INJECTION MOLDED BOW COMPASS

Goodwin F. Hanson, 4640 W. 118th St., Hawthorne, Calif. 90205

Filed Apr. 11, 1977, Ser. No. 786,516
Int. Cl.[2] B43L *9/22*
U.S. Cl. 33—27 B **3 Claims**



1. A compass or divider comprising first and second leg members having a pivotal relationship to each other, a stem extending between the leg members providing for angular adjustment of said leg members toward and away from each other, said stem having threaded means at one end, said first

leg member having threaded means rotatably mounted thereon, said threaded end of said stem being threadly engaged in said threaded means to allow pivoting of said stem about the rotation axis of said threaded means, said second leg being provided with a keyhole shaped opening having a larger part and a smaller part, the other end of said stem having a diameter which will fit into the smaller part of said opening and having spaced parts of a larger diameter to fit into said larger part of said opening, said stem being pivoted with said threaded means with respect to said first leg and directly connected to said second leg via said opening and said larger diameter parts for coarse adjustment of said first leg with respect to said second leg and said stem is rotated about its axis for fine adjustment via said threaded engagement.

4,120,093

PLANAR MEASURING INSTRUMENT

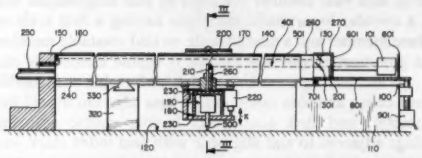
Alfons Spies, Munich, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Oct. 21, 1976, Ser. No. 734,536

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1975, 2547478; Jun. 5, 1976, 2625489

Int. Cl.[2] G01B *7/34*

U.S. Cl. 33—174 P **30 Claims**



1. A measuring instrument for measuring the extent to which the surface of an object deviates from a reference line comprising:

means for generating a substantially collimated light beam which defines the reference line;

means for measuring the position with respect to the reference line of the surface of the object along a measuring direction;

detection means associated with the measuring means adapted to detect the light beam and to register the deviation along the measuring direction of the measuring means from the light beam; and

position adjusting means responsive to the detection means adapted to adjust the position of the measuring means automatically to substantially eliminate the deviation.

4,120,094

MEASURING DEVICE FOR SPAGHETTI OR THE LIKE

Peter Pfaelzer, 50 Larry La., Oakland, Calif. 94611

Filed Feb. 14, 1977, Ser. No. 768,092

Int. Cl.[2] G01B *5/00, 5/26*

U.S. Cl. 33—174 T **3 Claims**

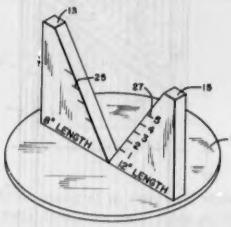
1. A measuring device particularly adapted for measuring uncooked spaghetti or the like comprising

a base member having a generally planar horizontally disposed upper surface wherein said base member is sized and shaped such that the hard spaghetti sticks or other noodles may be placed thereon and supported thereon substantially parallel to said upper surface,

a pair of upright support members mounted on said base for permitting the spaghetti sticks or other noodles to be stacked vertically on said base between said members to at least the top thereof, and

indicia disposed on at least one surface of at least one of said upright support members for indicating the number of individual servings of spaghetti or other noodles stacked upon said base.

3. A measuring device particularly adapted for measuring uncooked spaghetti or the like comprising a base member and a pair of upright support members secured to said base member, said pair of upright support members having opposed faces angled with respect to each other wherein said base member



and said pair of upright support members are formed to receive and support hard spaghetti sticks or other generally straight noodles in horizontally oriented positions in a vertically stacked arrangement between said pair of upright support members, said measuring device further comprising measuring indicia disposed on at least one surface of at least one of said upright members for indicating the amount of spaghetti or other noodles disposed between said upright support members.

4,120,095

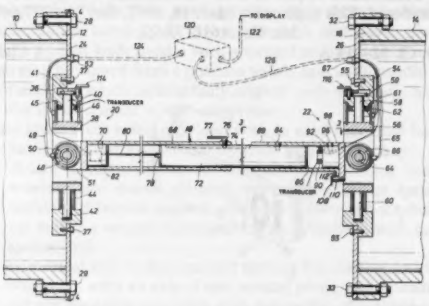
METHOD AND APPARATUS FOR DETERMINING THE SPATIAL RELATIONSHIP BETWEEN TWO MISALIGNED TUBULAR MEMBERS

Maurice P. Lebourg, One Greenway Plaza East Suite 428, Houston, Tex. 77046

Continuation-in-part of Ser. No. 609,196, Sep. 2, 1975, abandoned. This application Aug. 10, 1976, Ser. No. 713,281

Int. Cl.[2] G01B *3/38*

U.S. Cl. 33—180 R **28 Claims**



4. A method of determining the spatial relationship between two misaligned pipes comprising the steps of:

placing a frame including a gimbal assembly on each pipe end to define, with respect to a known reference point on each pipe, a pair of three-axis orthogonal coordinate systems having their respective origins at known positions relative to the centers of the two pipe faces, a first coordinate system having a pair of mutually perpendicular X, Z axes defined by the axes of the first gimbal assembly and lying in a plane parallel to the first pipe face and a Y axis defined by the centerline of the first pipe, and a second coordinate system having a pair of mutually perpendicular X', Z' axes defined by the axes of the second gimbal assembly and lying in a plane parallel to the second pipe face and a Y' axis defined by the centerline of the second pipe;

measuring by direct readings the following geometric parameters:

(a) the center-to-center distance between the origins defining a line segment, L_1;

(b) the angular displacement, θ, of L_1 about the Z axis;

(c) the angular displacement, ϕ, of L_1 about the X axis;

(d) the angular displacement, θ', of L_1 about the Z' axis;

(e) the angular displacement, ϕ', of L_1 about the X' axis; and

(f) the angular displacement, γ, between axes X, Z and axes X', Z' as projected onto a plane perpendicular of L_1.

21. An apparatus for determining the spatial relationship between two misaligned pipes having substantially planar ends and for identifying on each face of an interconnecting spool a point which will coincide after assembly with a known point on the face of each pipe, comprising:

a pair of frames adapted for attachment to the pipe ends and having aligning means for referencing the orientation thereof with respect to a known point on the pipe;

first and second gimbal assemblies each mounted on a frame and defining a three axis orthogonal coordinate system having two mutually perpendicular axes lying in a plane parallel to the face of the end;

a staight extensible connector member connected at its end to said first and second gimbal assemblies to define a straight line between the gimbal assemblies;

said connector member having means capable of defining and retaining a known displacement of one gimbal system with respect to the other;

a transducer for each gimbal axis for registering the rotation of said member about the two axes of the respective gimbal assemblies when the gimbals thereof are positioned for connection to said member;

a fifth transducer for registering the length of said extensible member when connected between the gimbal assemblies; and

means for transmitting the values of the parameters registered by said transducers to a read-out device at a remote location.

4,120,096

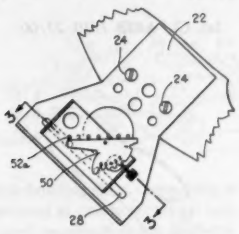
BOW SIGHT

Charles R. Keller, 411 Old Evans Rd., Martinez, Ga. 30907

Filed Jun. 13, 1977, Ser. No. 805,743

Int. Cl.[2] F41G *1/02*

U.S. Cl. 33—265 **4 Claims**



1. A sight for use on a bow for aiding an archer in sighting on a target from both an elevated and level shooting position, said sight comprising:

an elongated sighting element having at least one sighting bead thereon,

means for pivotally mounting said elongated extending sighting element on a horizontal axis,

said sighting element being balanced about said horizontal axis so that said bead pivots about said horizontal axis as said bow is tilted for automatically determining the proper elevation of said bow when shooting from an elevated position,

said elongated sighting element including:

(i) an arcuate surface adjacent a bottom portion thereof,

(ii) a plurality of slots spaced about said arcuate surface, and

means for inserting a locking element in one of said slots for locking said elongated sighting element in a predetermined position about said horizontal axis.

4,120,097

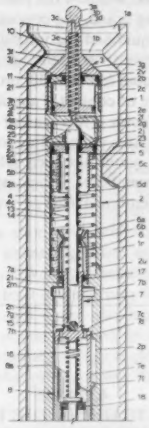
PULSE TRANSMITTER

John Doise Jeter, 201 W. Clara, Iowa Park, Tex. 76367

Filed Oct. 2, 1974, Ser. No. 511,218

Int. Cl.[2] E21B *47/022*

U.S. Cl. 33—307 **16 Claims**



1. A device to create pressure pulses in fluid moving in a pipe string for use in earth bore hole related operations to transmit information to the earth surface from a down hole assembly attached to a pipe string comprising; first valve means supported in the pipe string through which at least part of the fluid flows to change the resistance to flow to produce periodic pressure pulses in said fluid by movement to and from a first position of generally more flow restriction and a second position of generally less flow restriction, moving means to move said first valve from said first position to said second position, actuator means having a second valve positionable in two positions to control the movement of the moving means, said actuator means also having means responsive to the fluid pressure differential across the first valve means to move the second valve means to one of said two positions at a repetition rate and thus control the movement of the moving means to cycle at said repetition rate to constantly cycle the first valve means between said first and second positions, sensor means to sense at least one downhole condition, regulator means responsive to the output of said sensor to control the cyclic repetition rate of said actuator means so that the pressure pulses periodically produced in the fluid will have a repetition rate that is proportional to the output of said sensor.

4,120,098

SOLVENT EXCHANGE DRYING OF MEMBRANES FOR GAS SEPARATION

Philip Manos, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 22, 1976, Ser. No. 698,695

Int. Cl.[2] B01D *31/00*

U.S. Cl. 34—9 **6 Claims**

1. In the process for drying a semipermeable, polymeric membrane that is wet with an aqueous membrane-wetting liquid by contacting the wet membrane with at least one re-

placement liquid inert to the membrane and to the membrane-wetting liquid to remove water from the membrane and removing the replacement liquid from the membrane; the improvement which comprises contacting, at a temperature of about from −50° C. to 50° C., said wet semipermeable polymeric membrane in which the polymer has a Critical Surface Tension of at least about 42 dynes per centimeter with at least one replacement liquid consisting essentially of at least one organic solvent which is selected from the class consisting of an aliphatic alcohol having 1–3 carbon atoms, acetonitrile, and an aqueous solution thereof, and in which the organic solvent is capable of penetrating the membrane and has a surface tension of less than about 35 dynes per centimeter at 20° C., and a hydrogen bonding parameter of at least about 1.5 (calories per cubic centimeter)$^{\frac{1}{2}}$, and wherein the relative surface tension of the membrane wetting liquid, the concentration of the solvent in the replacement liquid and the viscosity and the molar volume of the organic solvent are such as to provide a Permeation Factor less than or equal to about 50, provided, however, that when the temperature of contact is about from 20° C. to −50° C., the Permeation Factor is less than or equal to about 100 − 2.5 T, wherein T is the temperature of contact in degrees centigrade; and after water has been substantially completely removed from the membrane, evaporating the replacement liquid to obtain a membrane free of water and replacement liquid.

4,120,099

APPARATUS FOR TRAINING THE TELECONTROL OF A MODEL HELICOPTER OR THE LIKE

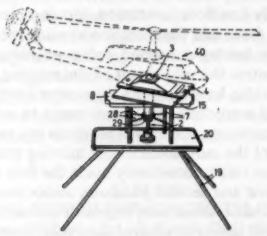
Helmut Fett, Lovenicher Weg 15, 5000 Cologne 41, Fed. Rep. of Germany

Filed Mar. 31, 1977, Ser. No. 783,281

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1976, 2613734

Int. Cl.^{2} G09B *9/08*

U.S. Cl. 35—12 K **23 Claims**



1. Apparatus for training remote control of a powered model helicopter comprising a base plate, a generally upright telescopic support having upper and lower end portions, first means connecting said lower end portion to said base plate, an assembly plate adapted to have a model remote controlled helicopter secured thereto, second means in the form of a universal joint connection between said upper end portion and said assembly plate whereby a model helicopter under power secured to said assembly plate is capable of roll, yaw and pitch motions, said upright telescopic support upper and lower end portions being defined respectively by a sleeve and a rod, said rod being secured to said base plate by said first connecting means, and means removably securing a portion of said second universal joint connecting means to said sleeve.

4,120,100

EDUCATIONAL BOOK

Judith A. Dugan, Santa Barbara, Calif., assignor to David S. Magee, Flint, Mich., a part interest

Filed Jan. 13, 1977, Ser. No. 759,195

Int. Cl.^{2} B44F *7/00*

U.S. Cl. 35—73 **13 Claims**

1. An educational book comprising:

a plurality of pages having adjacent edges;

fastening means for holding the pages together along the adjacent edges for turning movement relative to each other;

means for interconnecting adjacent pages to assemble the book into a three-dimensional object, the interconnecting means including a flap portion extending from one surface of each page, the flap portion having spaced side walls connected along at least portions of the periphery thereof to define a pocket therebetween, the opening of each pocket communicating with the other surface of the page through said page and receiving at least portions of the flap portion of the rearwardly adjacent page thereinto to hold the pages together; and,

wedge means disposed between the spaced side walls of each flap portion for providing an enlarged pocket between said spaced side walls.

4,120,101

ORTHOPAEDIC FOOTWEAR

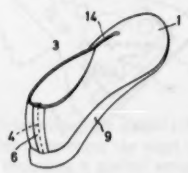
John Alan Drew, 433 Uxbridge Rd. Ealing, London W.5., England

Filed Dec. 15, 1976, Ser. No. 750,716

Claims priority, application United Kingdom, Jul. 7, 1976, 28295/76

Int. Cl.^{2} A43B *1/10, 23/00*

U.S. Cl. 36—4 **9 Claims**



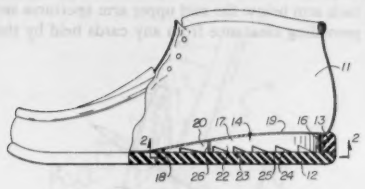
1. An article of orthopedic footwear adapted to be selectively modified to conform to the foot of the wearer having a sole, an upper sheet of thermosoftening material secured to the sole, the upper sheet having two edges permanently joined at a seam, strip of thermosoftening material having edges that are welded to the outer surface of the upper sheet covering the seam, the article having means allowing trimming of the article to selectively modify the article to conform to the foot of the wearer and to retain the structural integrity and modified shape of the article when so modified.

4,120,102

HEEL PAD WITH RADIAL RIBS

Robert H. Kenigson, 601 Pisces La., Foster City, Calif. 94409

Filed Apr. 21, 1977, Ser. No. 789,510
Int. Cl.[2] A43B *19/00, 21/32, 7/24*
U.S. Cl. 36—71 5 Claims



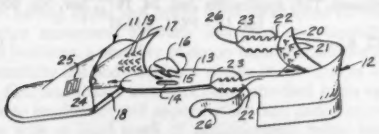
1. A removable insert pad shaped and dimensioned to fit inside the heel of a conventional shoe from the back of said shoe to about the beginning of the arch, said pad being formed of a resilient material, the top surface of said pad being smooth, the underside of said pad being formed with a plurality of ribs cut into said underside radiating outward from a position near the middle of the wearer's heel extending out to the margin of said pad, each said rib being deformable under the weight of the wearer's heel to flex in a direction tending to twist the heel from the wearer's opposite foot, the back edge of said pad being rounded to conform to the inside of the back of said shoe, the side edges being parallel to each other and the front edge being transverse to said side edges, the width of said ribs increasing proceeding outwardly from the center of said pad.

4,120,103

DISPOSABLE BOWLING SHOE

Robert D. Colby, 280 W. State St., Montrose, Mich. 48457

Filed Sep. 22, 1977, Ser. No. 835,778
Int. Cl.[2] A43B *3/26, 5/00*
U.S. Cl. 36—97 3 Claims



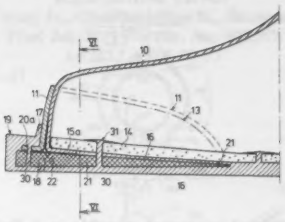
1. A disposable bowling shoe, comprising a toe portion with an inner sole secured at one longitudinal side edge, an adjustable arch support received within said toe portion, a heel portion, and an inner sole secured at one longitudinal side edge within said heel portion; said arch support including a tab having a T-shaped tongue, said tongue being received within and rotated within an elongated slot of said arch support, said tab comprising an adjustable arch member so to fit all sizes of feet, and when one end of said arch support is received within said toe portion and the other end is received within said heel portion beneath said inner soles of said toe portion and heel portion, said inner soles are folded downwards and the wearer, by applying pressure, with his foot, will cause a plurality of pointed and spaced-apart tabs of said inner sole to puncture the ends of said arch support, and thus render said arch support secure within said shoe.

4,120,104

SHOE FOR CROSS-COUNTRY SKIING

Raimo Juhani Lasmo, Espoo, Finland, assignor to Karku-Titan Oy, Finland

Filed Mar. 3, 1977, Ser. No. 774,144
Claims priority, application Finland, Mar. 9, 1976, 760599
Int. Cl.[2] A43B *5/04;* A43C *13/08*
U.S. Cl. 36—117 5 Claims



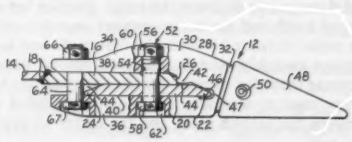
1. In a shoe, such as a shoe for cross-country skiing, an upper, an insole fixed thereto, and an outsole in the form of a casting, the improvement wherein said upper has at a front tip region a layer of sheet material having an outer surface situated at the exterior of the shoe with said layer of sheet material having an outwardly extending lower edge region embedded in said outsole, said outwardly extending lower edge region being formed with at least one aperture through which part of said outsole extends, said upper also having an inwardly extending lower edge region fastened to said insole with said insole and inwardly extending edge region being formed with an aperture passing therethrough and filled with material of said outsole.

4,120,105

BUCKET ADAPTER WITH LOAD ABSORBING MEANS

Visvaldis A. Stepe, Willow Springs, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 15, 1977, Ser. No. 824,599
Int. Cl.[2] E02F *9/28*
U.S. Cl. 37—142 R 15 Claims

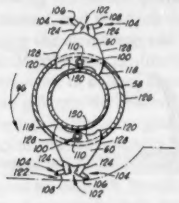


1. An earthworking implement, comprising:
(a) a support plate having one forward end;
(b) a cutting edge extending forwardly of said one forward end of said support plate and having one forward cutting end;
(c) a tooth adapter having rearwardly extending upper and lower legs forming a cavity therebetween, said support plate and said cutting edge extending into said cavity, said adapter having an integral load-absorbing shoulder extending into said cavity and abutting said one forward end of said support plate; and
(d) means for securing together said support plate, said cutting edge, and said legs.

4,120,106
SIDEBANK EXCAVATOR WITH ROTATING VERTICAL CUTTER ASSEMBLY

Donald Wayne Smith, Edmond; George W. Swisher, Jr., Oklahoma City, and Larry W. Teel, Yukon, all of Okla., assignors to CMI Corporation, Oklahoma City, Okla.

Filed Apr. 14, 1977, Ser. No. 787,629
Int. Cl.[2] E02F 3/24; B65G 57/00
U.S. Cl. 37—190 6 Claims



1. In a sidebank excavator movable in a first transverse direction along and adjacent to an embankment and in a second transverse direction substantially opposite to the first transverse direction, the excavator having a conveyor assembly for conveying particulate material deposited on a receiving portion thereof to a discharge portion thereof remote from the receiving portion, the improvement comprising:

an elongated cutter support assembly having a lower end connected to the excavator adjacent to the receiving portion of the conveyor assembly for rotation about the longitudinal axis of the cutter support assembly, and an upper end connected to the excavator with the longitudinal axis of the cutter support assembly extending upwardly from the lower end thereof;

means for rotating the cutter support assembly about the longitudinal axis thereof in a selected one of a first rotary direction and a second rotary direction substantially opposite to the first rotary direction;

a cutter having an inner end pivotally connected to the periphery of the cutter support assembly and an outer end disposed radially outwardly of the inner end thereof relative to the axis of the cutter support assembly, the cutter having an earth engaging portion extending generally outwardly from the outer end thereof relative to the axis of the cutter support assembly with a first tooth extending generally orthogonal to the axes of the cutter and the cutter support assembly generally in the first rotary direction, and a second tooth extending generally orthogonal to the axis of the cutter and the cutter support assembly but substantially opposite to the first tooth, the cutter being rotatable about the inner end thereof in a first pivotal direction to decrease the radial distance between the second tooth and the cutter support assembly relative to the radial distance between the first tooth and the cutter support assembly, and in a second pivotal direction to decrease the radial distance between the first tooth and the cutter support assembly relative to the radial distance between the second tooth and the cutter support assembly; and

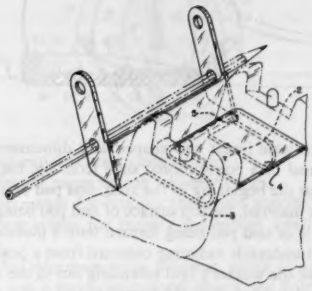
means for preventing the introduction of particulate material into the pivotal connection between the cutter and the cutter support assembly.

4,120,107
TELEPHONE BRACKET FOR HOLDING ADVERTISING AND WRITING INSTRUMENT

Michael P. Bukowsky, 6942 Birdie La., St. Louis, Mo. 63129

Filed Dec. 8, 1976, Ser. No. 748,509
Int. Cl.[2] G09F 3/00
U.S. Cl. 40—336 4 Claims

1. A bracket for use in conjunction with a telephone and designed for rotatably supporting a collection of advertising cards in addition to holding a writing instrument comprising a base member, a panel connecting to said base member and extending angularly at an obtuse angle upwardly from said base member, a pair of arms, one of each arm connecting to said panel at a side thereof and projecting upwardly beyond said panel, each arm having an aperture provided through its proximate upper end and designed for accommodating the rotatable support of the advertising cards therein, a slot provided in each arm below the said upper arm apertures and at a distance providing clearance from any cards held by the said

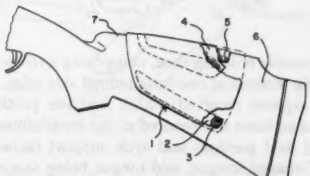


rotatable support, the slot in each arm comprising an aperture, and said apertures being aligned for holding a writing instrument therethrough, a retainer, an integrally curved portion connecting said base member and said retainer together, said base member, retainer, and their integrally curved portion provided for clamping onto the telephone to thereon display the rotatable advertising cards and dispose its held writing instrument for convenient usage, and a double faced adhesive tape attaching to the underside of the base member and capable of securing the backet to a supporting surface.

4,120,108
GUN STOCK COVERS

Charles K. Vickers, and Patricia A. Vickers, both of 160 Friar La., McMurray, Pa. 15317

Continuation-in-part of Ser. No. 669,199, Mar. 19, 1976, abandoned. This application Jun. 24, 1977, Ser. No. 809,906
Int. Cl.[2] F41C 23/00
U.S. Cl. 42—74 7 Claims

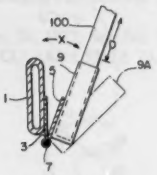


1. A cover for a gun stock including a comb comprising a pad of flexible material dimensioned to cover the comb and depend therefrom along both sides of the gun stock short of the bottom thereof, a layer of flexible material affixed to the under side of the pad, and mating quick connect-disconnect separable fastener elements, one such fastener element being affixed to each lower edge of the pad and one such mating fastener element being affixed to the gun stock on each side thereof.

4,120,109
EXTENDED MAGAZINE HOLDER

Daniel Dennis Musgrave, 8201 Caraway St., Cabin John, Md. 20731

Filed Aug. 2, 1977, Ser. No. 821,246
Int. Cl.[2] F41C *27/00*
U.S. Cl. 42—90 7 Claims

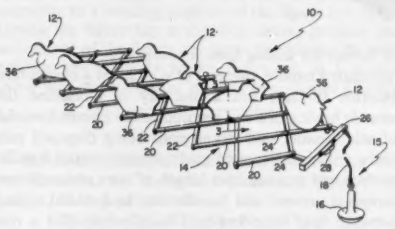


1. A device for holding a cartridge magazine in an extended position comprising releaseable means adapted for engagement with said magazine near a base of said magazine and a structure supported on the person of a user and positionally adapted for support of said means, said means being adapted for said engagement while said magazine is inserted into a magazine receptacle of a firearm.

4,120,110
DUCK DECOY

Anthony Aeschliman, Berkley St., Berkley, Mass. 02780

Filed Feb. 14, 1977, Ser. No. 768,482
Int. Cl.[2] A01M *31/06*
U.S. Cl. 43—3 9 Claims

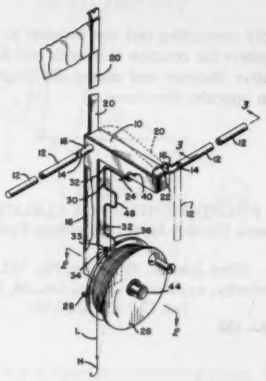


1. A decoy assembly comprising a longitudinally oriented support having upper and lower surfaces adapted for relative respective movement between collapsed and laterally expanded positions, a plurality of decoy members each including a substantially flat body having a profile in the form of a duck or the like, said decoy members being attached in an upright attitude to portions of said upper surface only and in an overall pattern with at least some of said members being laterally displaced from each other, at least some of said members being pivotal about individual upright axes with respect to said support, whereby said decoy members are longitudinally aligned in closely spaced lateral relationship in said collapsed position and pivotal about said upper surface in said expanded position so as to assume varying rotational positions with respect to said overall pattern, said support being a lazy-tong unit including a first set of substantially parallel longitudinally oriented laterally spaced elongated elements defining said upper surface and a second set of substantially parallel longitudinally oriented laterally spaced elongated elements underlying said first set thereof and defining said lower surface, said sets of elements crisscrossing over one another with at least some vertically adjacent elements in said respective sets thereof being pivotally interconnected to each other so that said support may be moved in an overall single accordian fashion motion between said collapsed and expanded positions, while maintaining said parallel disposition of the elements of respective sets thereof in parallel disposition to each other, said assembly being adapted to float in use upon a body of water and said lazy-tong unit enabling separate longitudinally spaced portions thereof to upwardly flex from the unit as a whole so as to enable an undulating movement responsive to wavelike motion of said body of water to occur in said assembly while floating.

4,120,111
ICE-FISHING TIP-UP

Russell L. Young, Jr., 424 Washington St., Boonton, N.J. 07005

Filed Jul. 30, 1974, Ser. No. 493,167
Int. Cl.[2] A01K *97/12*
U.S. Cl. 43—17 4 Claims



1. An ice-fishing tip-up, comprising:
a body;
a reel for storage, pay-out, and retrieval of line;
said reel being coupled to said body for rotation in one direction for line retrieval and for rotation in an opposite direction for line pay-out;
a plurality of support limbs pivotally coupled to said body;
a resilient, tip-up signalling indicator coupled to said body;
means carried by said body for holding said indicator in a non-signalling position; and
means carried by said reel and said body cooperative for releasing said indicator from said holding means; wherein
said body has a support extending therefrom in cantilever fashion;
said reel is rotatably mounted on said support;
said support is threaded; and further including
means for securing said reel on said support; wherein
said securing means is threaded for threadedly engaging said support;
said securing means, upon being threadedly engaged with said support and torqued, with a selective force, in said one direction, is urged against a surface of said reel for adjustably constraining said reel against rotation with a selective constraint; and
said constraint-effecting securing means, responsive to a forced rotation of said reel in said opposite direction, also rotates in said opposite direction to immediately and incrementally release said selective constraint of said reel.

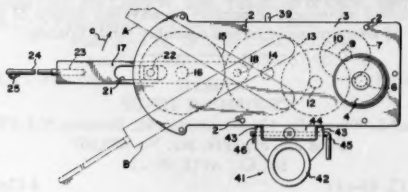
4,120,112
APPARATUS FOR AGITATING A FISHING LINE

Alexander J. McBain, 5395 Frovan, Saginaw, Mich. 48603

Filed Oct. 18, 1976, Ser. No. 733,035
Int. Cl.[2] A01K *87/00*
U.S. Cl. 43—19.2 9 Claims

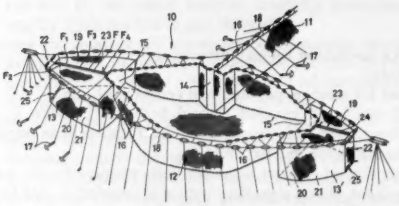
1. Apparatus for agitating a fishing line comprising a base; an elongate arm member; a pair of rotary members in driving engagement with each other; means mounting each of said

members on said base for rotation about its own axis; means eccentrically connecting said arm member to one of said rotary members for rotation therewith; coupling means eccentrically



and slideably connecting said arm member to the other of said rotary members for rotation therewith and for sliding movements relative thereto; and means for rotating said rotary members in opposite directions.

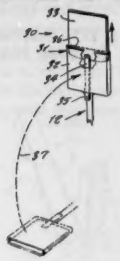
4,120,113
POUND FISHING NET STRUCTURE
Kiyoo Yoneya, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Japan
Filed Jan. 21, 1977, Ser. No. 761,449
Claims priority, application Japan, Jan. 24, 1976, 51/6626[U]
Int. Cl.[2] A01K *69/00*
U.S. Cl. 43—100 **3 Claims**



1. A pound fishing net structure comprising a fence net, a vestibule enclosure net, a plurality of trap nets, each trap net comprising a ceiling webbing, a bottom webbing and a peripheral webbing having a fish outlet, said ceiling webbing having an elongated slit extending substantially over the full length of said ceiling webbing, and an opening and closing means attached to the edges of said slit for opening and closing the same.

4,120,114
FLY SWATTER WITH EXTENDABLE HANDLE
Donald H. Little, c/o George Spector 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007
Filed Dec. 16, 1976, Ser. No. 751,129
Int. Cl.[2] A01M *3/02*
U.S. Cl. 43—137 **4 Claims**

1. An extendable fly swatter comprising in combination a striking pad secured to a handle, said pad comprising a fixed member secured to one end of said handle and an extendable member slidably mounted on said fixed member, including means elastically securing said movable member to said handle whereby said movable member can move from a normal unextended position to extended positions, said means biasing said movable member to said unextended position, the movement to the extended positions resulting from centrifugal forces exterted during fly swatting, wherein said movable member

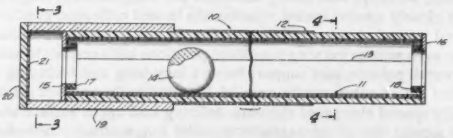


and said fixed member having abutting surfaces in all positions providing a swatting surface that is continuous in all positions.

4,120,115
SWITCH
Nicholas M. Mushkin, 4755 E. Flamingo, Las Vegas, Nev. 89109
Filed Jan. 10, 1977, Ser. No. 757,989
Int. Cl.[2] A01M *3/02*
U.S. Cl. 43—137 **7 Claims**

1. A device for killing insects comprising:
an elongated handle, one end of which has a circumferential exterior surface, and a plurality of elongated flexible strands having one end secured to the circumferential end of said handle, said strand ends being disposed substantially uniformly around said circumferential handle end surface and secured by a length of wire circumferentially wrapped around said handle end, said strand ends lying between said wire and said handle end, and a resilient member disposed between said handle end surface and said strand ends, whereby said wire is wrapped to force said strand ends securely against said resilient member.

4,120,116
OPTICAL TOY
Guy Williams, 11816 Goshen Ave., Los Angeles, Calif. 90049
Filed Jan. 31, 1977, Ser. No. 763,724
Int. Cl.[2] A63H *33/00*; G02B *27/08*
U.S. Cl. 46—1 R **10 Claims**



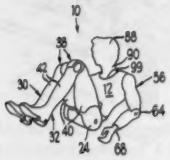
1. A toy comprising a circular tubular member with a mirrored inner surface, said tubular member containing a transparent sphere rollable through the interior of said tubular member, said tubular member having a retaining means on each end for preventing said sphere from passing from said tubular member, said retaining means forming an eyepiece to permit viewing

and having a prismatic refraction means positioned over the outer end of said tubular member.

4,120,117
ARTICULATED FIGURE TOY

Rouben T. Terzian, Chicago; Howard J. Morrison, Deerfield; Palmer J. Schoenfield, Evanston, and Wayne A. Kuna, Elmhurst, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 26, 1977, Ser. No. 762,407
Int. Cl.[2] A63H *13/12, 13/16*
U.S. Cl. 46—130 10 Claims

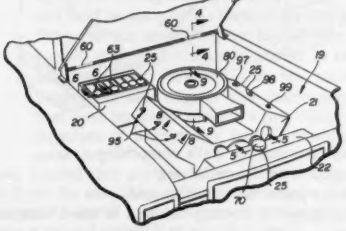


1. An articulated figure toy comprising:
a central torso portion;
an upper torso portion pivotally coupled to said central torso portion;
a lower torso portion pivotally coupled to said central torso portion; and
connecting means connected between said upper and lower torso portions, said connecting means including a biasing means having a stable over-center position when the torso portions are generally aligned corresponding to a standing position of the figure toy and a released position corresponding to a bending position of the figure toy, for maintaining the figure toy in the over-center position and for movement of the figure toy torso portions to the released position upon impact to the figure toy in a manner to move said biasing means off said over-center position.

4,120,118
SEMI-DISASSEMBLABLE TOY VEHICLE

Richard Mathews, and Lorraine Mathews, both of 12909 S. Escanaba, Chicago, Ill. 60633

Filed Jan. 6, 1977, Ser. No. 757,486
Int. Cl.[2] A63H *11/10*
U.S. Cl. 46—201 8 Claims

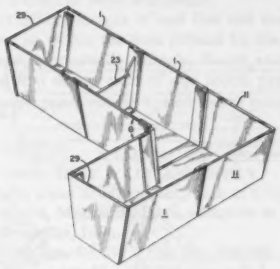


1. A semi-disassemblable toy vehicle, comprising in combination, a vehicle body having a hinged openable hood and a hinged openable trunk lid, an engine compartment recess behind the openable hood, a trunk compartment recess behind the openable trunk lid, a plurality of engine, radiator and battery representations affixed within the engine compartment recess, each such representation carrying at least one loosenable member, each representation and the carried loosenable member together defining means for permanently preventing the loosenable member from being entirely removed from the representation, and a plurality of tool members adapted to fit within and be removed from the trunk compartment recess, each tool including a tool head adapted to engage at least one but not all of the loosenable members and operate only the fitted loosenable member so as to alternatively loosen and tighten the fitted loosenable member in the associated carrying representation.

4,120,119
ELBOW PLANTER BOX

Hugo George Engel, Somerville, N.J., assignor to Superior Tool & Manufacturing Company, Somerville, N.J.

Filed Jul. 29, 1976, Ser. No. 709,769
Int. Cl.[2] A01G *9/02*
U.S. Cl. 47—66 7 Claims



1. In a planter box adapted for containing plants, the combination comprising:
at least two box-like receptacles each having a bottom, opposing sides, an open top, and at least one open end;
an elbow-like receptacle having an open top, a bottom, two pairs of opposing sides, and two open reduced ends forming flanges and offset from one another at a given angle greater than zero and less than 180°, said flanges each being dimensioned for snugly fitting within and being rigidly attached to the sides and bottom of an open end of two individual ones of said box-like receptacles, respectively, thereby connecting said receptacles together at said given angle; and end cap means for selectively closing any open ends of said box-like receptacles, and means for connecting said receptacles so that the outside surfaces of said planter box between the end caps have substantially no discontinuities except for those at the bend of the elbow-like receptacle.

4,120,120
LIFTING ARRANGEMENT FOR A WINDOW OF A VEHICLE AND THE LIKE

Herbert Becker, Coburg-Neuses, Germany, assignor to Metallwerk Max Brose GmbH & Co., Coburg, Germany

Filed Nov. 23, 1977, Ser. No. 854,139
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1976, 2654902
Int. Cl.[2] E05F *11/14*
U.S. Cl. 49—351 8 Claims

1. In a window lifting arrangement including a support member, a window carrier member mounted on said support member for movement in a vertically extending path, stop means on said support member for limiting said movement, drive means on said support member, and linkage means drivingly connecting said drive means to said carrier member, the linkage means including a link member, first securing means movably securing said link member to said carrier member, and second securing means securing said link member to said support member, the improvement in one of said securing means which comprises:

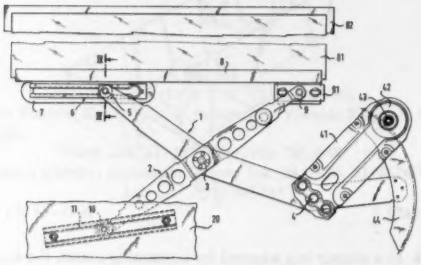
(a) a forked guide channel fixedly mounted on one of the two members secured to each other by said one securing means,

(1) said channel including two branch portions elongated in a common direction and a bight portion connecting respective, longitudinally terminal parts of said branch portions,

(2) said branch portions transversely bounding an elongated guide slot therebetween, and said bight portion bounding said slot in one longitudinal direction,

(3) said slot being approximately keyhole-shaped and having an enlarged, longitudinally terminal first part, and an elongated second part narrower than said first part,

(4) said branch portions being formed with respective longitudinal grooves open in a direction away from said slot,



(5) said one member having two edge portions received in said grooves respectively and thereby fastening said channel to said one member; and

(b) a guide pin fixedly mounted on the other secured member,

(1) said pin having a shank portion received in said slot for longitudinal movement and two enlarged head portions outside said slot on respective ends of said shank portion,

(2) the width of said first part of the slot being sufficient to pass one of said head portions,

(3) the width of said second part of the slot being smaller than the corresponding dimension of each of said head portions for securing said pin against transverse movement out of said second part.

4,120,121

METHOD AND APPARATUS FOR COLLECTING PRECIOUS METAL PARTICLES

Stuart A. Surman, 442 Silver Avenue, Southampton, Pa. 18966, assignor to Stuart A. Surman, Southampton, Pa.

Filed Feb. 14, 1977, Ser. No. 768,587
Int. Cl.[2] B24B *55/06*
U.S. Cl. 51—270 **17 Claims**

1. In a dust collecting apparatus, the combination of

an enclosure comprising a floor, a roof and a back, at least a portion of the back being transparent;

means to direct a flow of liquid interiorly of the enclosure to wet dust particles within the enclosure,

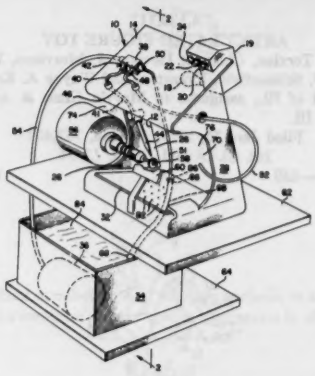
said means to direct comprising a water reservoir and a nozzle which directs a stream of water from the reservoir upon the dust;

a drain provided in the enclosure to lead water and entrained dust particles from the enclosure;

a source of illumination to light a working area interorly of the enclosure,

the source of illumination being mounted exteriorly of the enclosure in a position to direct light rays interiorly,

the said roof slanting forwarding from the back and wherein some of the light rays strike the roof, and



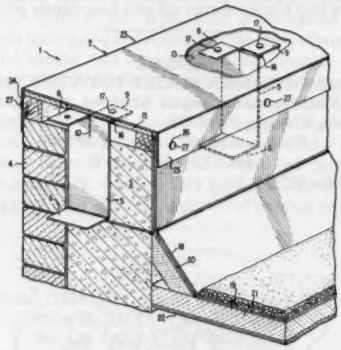
the underside of the roof being provided with a reflecting surface.

4,120,122

ROOF EDGE AND WALL CAP AND ANCHOR

Norman Bahr, P.O. Box 1845, Grand Island, Nebr. 68801

Filed Aug. 23, 1977, Ser. No. 826,983
Int. Cl.[2] E04D *13/00;* **E04B** *1/38*
U.S. Cl. 52—58 **8 Claims**



1. A cap assembly for walls comprising

a U-shaped cover frame having

a generally planar base portion and

a pair of supports forming the legs of the U-shaped cover frame

at lest one aperture in said base portion

means for anchoring said cover frame to a wall including an anchor member having

a bottom portion adapted for embedment in a wall and a split end adapted to extend upward from the wall through said aperture in said base portion, and

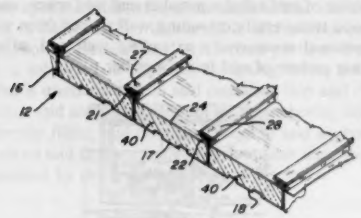
said split end of said anchor member being formed of a bendable sheet metal whereby said split ends may be bent over onto a surface of said base portion for securement thereon.

4,120,123

STRUCTURAL CAP AND COMPOSITE STRUCTURE FOR BUILDINGS AND THE LIKE

Gary A. Knudson, 17356 W. 57th Ave., Golden, Colo. 80401

Filed Nov. 15, 1976, Ser. No. 741,512
Int. Cl.[2] E04B *1/32, 1/88;* E04C *1/30*
U.S. Cl. 52—86 **5 Claims**



1. A panel assembly in a building structure comprising:

(a) a first panel connected between a second panel and a third panel, said panels having a bottom, a pair of sidewalls projecting from opposite side edges of the associated bottom providing an outer opening and a pair of interlocking flanges projecting in a first direction from the ends of said sidewalls and connected along a first seam structure and a second seam structure on the opposite sides of said first panel joining the sidewalls of said first panel with the adjacent sidewalls of said second and third panels,

(b) a fourth panel connected along the opposite side edges to said first and second seam structures covering the outer opening of said first panel, said fourth panel having:

(i) a body which includes a generally laterally extending intermediate portion in spaced overlying and covering relation to the bottom of said first panel providing a space closed on all sides,

(ii) first and second side portions attached to, extending along and projecting from the opposite side edges of said intermediate portion,

(a) said first side portion having:

(i) a first sidewall section disposed within and extending along a first sidewall of said first panel,

(ii) a first inside section angularly extending laterally in from said first sidewall section and away from said intermediate portion at a selected incline with the plane of said intermediate portion oppositely spaced from said first seam structure,

(iii) a first substantially straight flange section extending laterally out from said first inside section substantially parallel to said intermediate portion covering and strengthening said first seam structure and held in place by a substantially straight lateral flange section and a terminal lateral edge fastening section of an adjacent panel similar to said fourth panel covering the opening in said second panel joining one side edge of said fourth panel to said first seam structure to form a first composite seam structure of a generally hollow triangular structural shape,

(c) said second side portion located substantially laterally out from the associated intermediate portion and having:

(i) a second sidewall section disposed within and extending along a second sidewall of said first panel,

(ii) an arcuate section extending laterally generally in from and in horizontally spaced relationship to an associated intermediate portion providing a track for a seamforming device for fastening adjacent similar fourth panels to said first and second seam structures,

(iii) a second substantially straight flange section extending laterally out from said arcuate section in spaced substantially parallel relation to an associated intermediate portion covering and strengthening said second seam structure,

(iv) a terminal lateral edge fastening section projecting beyond said second flange section angularly folded back and laterally inwardly against a first inside section of a next adjacent panel similar to said fourth panel and said terminal lateral edge adapted initially to extend outwardly and toward an associated intermediate portion to form an inwardly facing channel-like configuration with a receiving opening of a sufficient lateral dimension in relation to the lateral dimension of the first lateral flange section and first inside section of said next adjacent panel similar to said fourth panel to receive them by insertion via said receiving opening, said receiving opening having been narrowed by a seam-forming device covering said receiving opening in said third panel joining the other side edge of said fourth panel to said second seam structure to form a second composite longitudinally continuous seam structure of a generally hollow triangular structural shape,

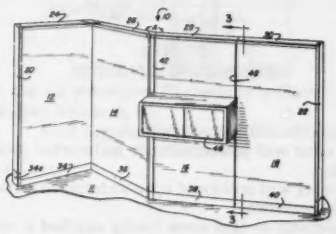
(d) said interlocking flanges of said first and second panels being secured within the area formed by the first inside section and substantially straight flange section of the associated first side portion of said fourth panel and said next adjacent panel similar to said fourth panel.

4,120,124

MOVABLE WALL ASSEMBLY

Philip A. Temple; Gene B. Hasbrouck, both of Corry, Pa., and Stanley M. Howe, Muscatine, Iowa, assignors to Hon Industries Inc., Muscatine, Iowa

Filed Jun. 21, 1977, Ser. No. 808,640
Int. Cl.[2] E04B *2/56*
U.S. Cl. 52—122 **29 Claims**



1. A movable wall assembly for selectively partitioning an interior space comprising, in combination, an elongated base; adjustable support elements spaced along said base; elongated leveling support means mounted on said support elements and adjustable therewith to effectuate leveling of said support means; wall panels supportably mounted on said leveling support means; a vertical post member at each vertical edge of said panels, each of said posts being supported on said support means and engaging the adjacent vertical edge of the respective panel; and tie means engaging upper portions of adjacent panels for mutual support thereof, whereby said levelling support means is adapted to be leveled prior to assembling said panels and post members thereon.

4,120,125

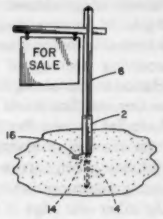
POST SUPPORT

Joseph Cvetan, 11549 S. Kedvale, Alsip, Ill. 60658

Filed Nov. 10, 1977, Ser. No. 850,081
Int. Cl.[2] E02D *5/74*
U.S. Cl. 52—156 **4 Claims**

1. A support comprising an elongated socket having a height sufficient to extend a substantial distance along the height of a post to be supported therein whereby a post may be supported solely by the support, an elongated spike-like member extending from the bottom of the socket for mounting in a supporting surface, a vertical stabilizing member extending outwardly

from the upper end of said pointed member and a horizontally extending flat plate attached only to the free end of the said



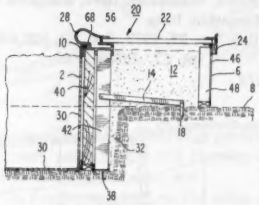
vertical stabilizing member whereby a post received in said socket will be entirely self-supported thereby.

4,120,126

PATIO POOL

Robert E. West, Yardley, Pa., assignor to Cascade Industries, Inc., Edison, N.J.

Filed Sep. 30, 1975, Ser. No. 618,104
Int. Cl.[2] E04H *3/16*
U.S. Cl. 52—169.7 **15 Claims**



1. A patio pool structure comprising

(a) an outer wall positioned upon undisturbed ground level earth;

(b) an inner wall positioned upon undisturbed earth within a pool excavation;

(c) a plurality of rigid struts fixedly attached at one end to said inner wall and at the other end to said outer wall for maintaining said inner wall and said outer wall in a fixed position whenever the pool is empty and whenever the pool is full;

(d) a filler material located above ground level between said outer wall and said inner wall and below ground level between said inner wall and the undisturbed earth to fill the space therebetween and provide a stable wall structure; and

(e) a patio platform assembly mounted upon the top edges of said inner wall and said outer wall and extending over said filler material.

4,120,127

DOUBLE GLAZED WALL STRUCTURE

S. Eugene Hubbard, Niles, Mich., assignor to Kawneer Company, Inc., Niles, Mich.

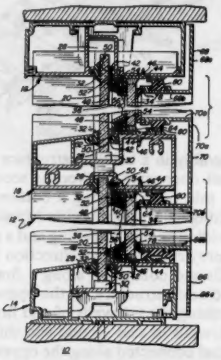
Filed Apr. 1, 1977, Ser. No. 783,802
Int. Cl.[2] E06B *7/12, 3/28*
U.S. Cl. 52—172 **38 Claims**

1. Apparatus for converting into a double glazed wall structure an existing single glazed wall structure of the type having a single thickness first glazing panel with a peripheral edge portion seated and supported in a glazing pocket of at least one frame member, said apparatus comprising:

a spacer element supportable from said frame member on one side of said first glazing panel and having a stop surface parallel thereof facing a parallel surface of an edge portion of a new second glazing panel disposed in spaced apart parallel relation from said first panel forming a dead air space therebetween,

said spacer element comprising an elongated hollow tubular member having a pair of spaced apart side walls facing said first and second glazing panels, a first wall extending transversely between said first and second side walls and having openings therein for communication between the interior of said tubular member and said space, and

a second transversely extending wall spaced from said first mentioned transversely extending wall and adjacent a facing surface of said frame member,



a tongue adjacent said one side of said first glazing panel extending inwardly of said second transversely extending wall into said glazing pocket of said frame member interlocked between a wall of said pocket and an adjacent surface of said first glazing panel,

desiccant material in communication with said space defined between said first and second glazing panels, and

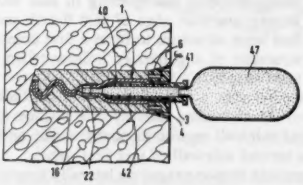
means for supporting an edge portion of said second glazing panel in place adjacent said spacing element.

4,120,128

ARRANGEMENT FOR SECURING OBJECTS TO SUPPORT STRUCTURES WITH MULTI-COMPONENT HARDENABLE BINDER MATERIAL

Mathias Pauls, Lauterbach, Fed. Rep. of Germany, assignor to Artur Fischer Forschung, Tumlingen, Waldachtal, Fed. Rep. of Germany

Filed Mar. 31, 1977, Ser. No. 783,196
Claims priority, application Fed. Rep. of Germany, Apr. 8, 1976, 2615185
Int. Cl.[2] E04B *1/41*
U.S. Cl. 52—173 R **10 Claims**



1. An arrangement for securing an object to a support structure having an anchoring hole, comprising a sleeve-shaped anchoring element having one part of transverse dimensions smaller than, and another part of transverse dimensions substantially corresponding to those of the anchoring hole, said anchoring element being insertable into the anchoring hole through an open end thereof so that said other part supports said anchoring element at the open end of the anchoring hole

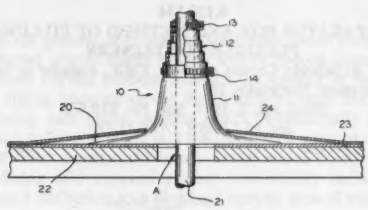
with clearance between the latter and said one part and closes the open end of said clearance upon insertion, said anchoring element having an interior passage; and a closed collapsible container accommodating components of a multi-component hardenable binding material and having a first portion fittingly insertable into said interior passage of said anchoring element and a second portion remaining outside of said anchoring element upon such insertion of the same so that when said first portion of said container is inserted in said interior passage of said anchoring element and said second portion of said container is subjected to requisite collapsing force, the binding material is discharged from said container into said clearance to anchor said anchoring element in the anchoring hole, without thereby filling said interior passage of said anchoring element about said first portion of said container since such filling is prevented by the presence of said first portion.

4,120,129

PIPE FLASHING UNIT

William M. Nagler, Chicago, Ill., and Vernon Earl Woosley, Richmond, Va., assignors to The Pate Company, Broadview, Ill.

Filed Sep. 1, 1976, Ser. No. 719,422
Int. Cl.[2] E04D *13/14;* E04G *15/06*
U.S. Cl. 52—219 **4 Claims**



1. A flashing unit to provide weather proof egress for a single pipe element through a roof surface, said flashing unit comprising:

a unitary hollow housing of seamless construction, having an axis perpendicular to said surface,

said housing being circular in cross-section perpendicular to said axis,

said housing having an upper end and a lower end,

said upper end and said lower end being open, thereby defining a passageway through said housing;

a circular base flange,

said flange formed integrally with said housing at said lower end,

said flange being formed perpendicular to said axis to contact a flat surface,

said housing tapering generally outwardly from said upper end to said flange; and

a hollow sealing element having a top and a bottom,

said sealing element including a plurality of concentric upstanding stepped sections of differing cross-sectional dimension,

said stepped sections being arranged in order of increasing cross-sectional dimension from said top to said bottom, said stepped sections being selectively severable whereby a communicating passageway through said sealing element may be formed,

said bottom of said sealing element sized to closely fit said housing at said upper end of said housing, whereby said housing, said pipe element, and said sealing element define a chase, sealed at its top, for said pipe element; and

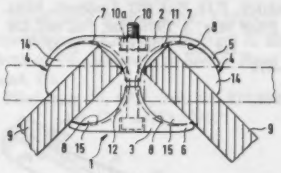
means for retaining said sealing element in weather tight contact with said housing and with said pipe element.

4,120,130

CLAMPING DEVICE

Felix Puschkarski, Zierleitengasse 40, A-1190 Wien, Austria

Filed Sep. 19, 1977, Ser. No. 834,781
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1976, 2642227
Int. Cl.[2] E04B *1/60*
U.S. Cl. 52—285 **16 Claims**



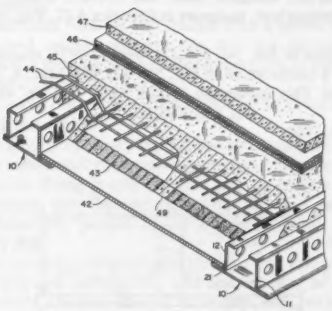
1. A clamping device for detachably connecting two plates disposed at an angle with respect to each other, the device comprising two clamping jaws connected to each other by bolt means and forming bearing seats on opposite sides of the bolt means, the bearing seats having cylindrical inner surfaces, cylindrical clamping bodies disposed and rotatable in each of said bearing seats about an axis approximately perpendicular to the bolt means as long as the clamping device is in an unmounted state, each of said clamping bodies consisting of a separate clamping element the cross sectional area of which has the form of a segment of a circular surface so that each clamping element has an arcuate and a plane side surface portion.

4,120,131

BUILDING STRUCTURE

Frank E. Carroll, Barrington, Ill., assignor to Carroll Research, Inc., Rolling Meadows, Ill.

Filed Sep. 3, 1976, Ser. No. 720,353
Int. Cl.[2] E04B *1/16*
U.S. Cl. 52—310 **19 Claims**



1. An insulated deck structure comprising:

a series of parallel sheet metal structural shapes which are symmetrical about a vertical bisecting plane having:

opposing generally parallel equal length sides, a flange extending outwardly at substantially 90° from one end of each of said sides, a base closure extending from the outermost end of one of said outwardly extending flanges to the outward end of the other of said outwardly extending flanges forming a closure between said parallel sides at said one end, and flanges projecting inwardly from the other end of each of said parallel sides a distance forming a slot between the terminal ends and said inwardly projecting flanges;

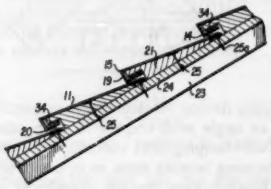
corrugated structural decking above and resting upon the inwardly extending flanges of said structural shapes; and insulation board resting on said outwardly extending flanges and extending between adjacent structural shapes beneath said corrugated structural decking.

4,120,132

METAL ROOFING SHINGLE AND HOLDING STRIP THEREFOR

John W. Kendrick, P.O. Box 441, Gulfport, Miss. 39501

Filed Mar. 3, 1976, Ser. No. 663,439
Int. Cl.² E04D *1/28, 1/34*
U.S. Cl. 52—478 **7 Claims**



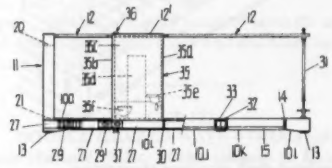
1. A metallic roofing shingle comprising a body portion of trapezoidal configuration wherein the top and bottom edges thereof are parallel and the bottom edge is of a dimension less that that of the top, a third edge thereof being substantially normal to the top and bottom edges, said bottom edge being bent and rebent to provide a channel, a holding strip disposed in backing relation to said shingle body; said holding strip being of wedge shape in cross-section, the thicker edge thereof having a rib; said rib being loosely disposed in said channel, whereby said rib is spaced from said bent and rebent edges and said channel is free to discharge moisture therein and permit circulation of air therearound.

4,120,133

METHOD OF CONSTRUCTING A TRANSPORTABLE PREFABRICATED ROOM ELEMENT

Franklin Bartlett Rodgers, Baar, and Herbert Grassl, Ruswil, both of Switzerland, assignors to Credelca A.G., Zug, Switzerland

Continuation of Ser. No. 366,276, Jun. 4, 1973, abandoned, which is a continuation of Ser. No. 121,992, Mar. 8, 1971, abandoned. This application Jul. 24, 1974, Ser. No. 491,532
Int. Cl.² E04B *1/35*
U.S. Cl. 52—745 **6 Claims**



1. A method of erecting a plural-storey building in which at least two uperimposed storeys comprise transportable prefabricated room elements constructed from room element sections, each room element being a cell-like structure, having two opposed sides and two opposed ends constituting four vertical faces of the cell, and comprising a rigid floor panel structure and a vertical load-bearing structure, of room height, rigidly connected to the floor panel structure adjacent to an end of the floor panel structure, the room elements being prefabricated at a factory remote from the building site by rigidly fixing the load-bearing structure to the floor panel structures, which room elements are subsequently transported from the factory to the building site and there disposed face-to-face in each of the said storeys with the room elements of each upper storey stacked on the room elements of the next lower storey and supported by the load-bearing structure or structures of the latter, the load-bearing structures of superimposed room elements being in vertical register, characterized in that each room element is superimposed by the following steps:

(a) prefabricating sections of the room element, each of which room element sections comprises a prefabricated section of the floor panel structure and any vertical load-bearing structure associated with that panel section in the completed room element,

(b) applying to the room element sections substantially all installations, glazing and surface finish associated with each room element section in the completed room element,

(c) assembling the room element sections in end-to-end relationship at the factory remote from the building site, with their floor panel sections in substantially a common plane, and

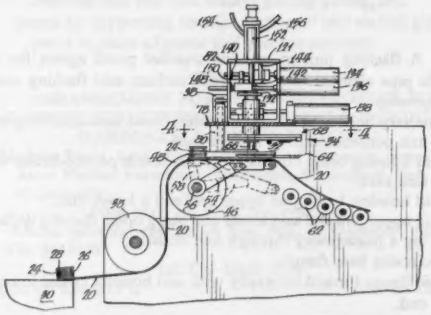
(d) rigidly connecting the room element sections, in said relationship, at the factory by structural means uniting the room element sections comprising assembled floor panel sections and vertical load-bearing structures into a rigid structural frame of the room element, thereby forming a rigid and substantially complete room element.

4,120,134

APPARATUS FOR AND METHOD OF FILLING FLEXIBLE CONTAINERS

William R. Scholle, Corona del Mar, Calif., assignor to Scholle Corporation, Northlake, Ill.

Filed Jul. 5, 1977, Ser. No. 815,533
Int. Cl.² B65B *3/00, 31/00*
U.S. Cl. 53—434 **33 Claims**



1. In an apparatus for filling flexible containers connected in continuous web form, each container having a spout communicating therewith adapted to be closed by a separable cap, means for incrementally advancing said containers seriatim to a filling station, filling means at said filling station for sequentially filling each container through the opening in its spout, and means for placing a cap on the spout to close the filled container, said advancing means then advancing the filled container from the filling station to move a succeeding empty container thereto.

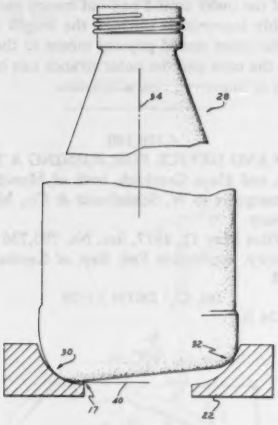
18. A method of filling containers each having a filling aperture therein adapted to be closed by a closure, comprising the steps of providing a plurality of containers connected together seriatim in a continuous row; moving the row of containers to move the containers seriatim to a filling station; and at the filling station, filling the respective container with contents through the aperture therein, and placing the closure on the container to close the aperture therein.

4,120,135

SUPPORTING THIN-WALLED CONTAINERS

Eugene P. Baldyga, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 1, 1976, Ser. No. 746,388
Int. Cl.[2] B65B 7/28
U.S. Cl. 53—473 11 Claims



1. In the process of protecting the fragile lower portion of a thin-walled plastic bottle having axially spaced upper finish and lower curved portions during axial loading of the bottle while filling, capping or the like which includes the step of restraining said lower portion against substantially radially outward deflection while said load is applied without supporting the finish portion, the improvement which comprises:

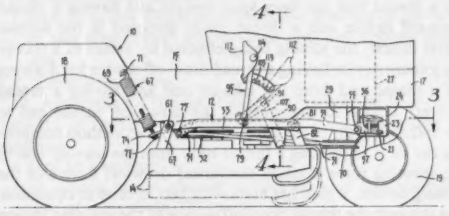
confining said restraint against substantially radially outward deflection to a localized curved area of said lower portion while maintaining a seating ring section unsupported during said loading.

4,120,136

IMPLEMENT SUPPORTING AND LIFTING LINKAGE

Jack Howard Rose, Livonia, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.

Filed Dec. 27, 1976, Ser. No. 756,022
Int. Cl.[2] A01D 35/12
U.S. Cl. 56—17.1 12 Claims



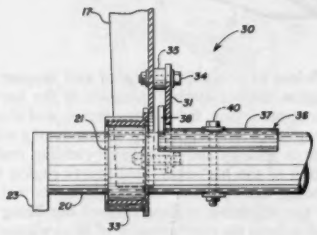
1. In a support for a mower beneath a tractor having a frame and an axle, scissor linkage means including draft link means and lift link means pivoted one to the other above said mower, means supporting said draft link means to said axle beneath said frame for vertical swinging movement, means supporting said lift link means to said frame for vertical swinging movement, pivot means connecting one portion of said mower to said draft link means and another pivot means connecting another portion of said mower to said lift link means, resilient means connected at one end to said frame and at its other end to said scissor linkage means to urge said scissor linkage and said mower upwardly to thereby overcome the effects of gravity acting thereon, lever means connected to said lift link means and pivotally mounted to said frame for moving said lift link means and said mower in relation to said frame, and foot treadle means connecting to said lever means for moving and maintaining said lever means in predetermined positions corresponding to predetermined elevations of said mower.

4,120,137

TINE BAR RETAINING DEVICE

Ernest A. Schoeneberger, Leola, and Edward A. Blakeslee, New Holland, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Aug. 19, 1977, Ser. No. 825,998
Int. Cl.[2] A10D 57/02
U.S. Cl. 56—226 9 Claims



1. In a crop harvesting apparatus of the type employing a cam operated rotating reel including rotatably and axially mounted and driven aligned spiders supporting, on respective aligned legs thereof, elongate tine bars journalled at respective support locations on each spider leg and movable laterally relative thereto, each said tine bar further including a cam follower on one end thereof for engagement with said cam to control the rotation of said tine bar relative to said spiders as they rotate 360° about the axis of said spiders, the improvement comprising:

a device for selective adjustment of the lateral position of each said tine bar relative to said spiders, said device including

a guide plate fixed to, and spaced from a lateral side of one of said spiders adjacent the tine bar journal location thereon forming a channel therebetween at least partially radially about said location;

a bolt-sized orifice through said tine bar adjacent said side of said one spider;

a clip having a primary leg portion and a tab portion extending substantially perpendicularly away therefrom, said tab portion fitting in said channel, said leg portion having an elongate slot therethrough with the long axis thereof substantially parallel to the longitudinal axis of the tine bar; and

a bolt extending through said slot and said orifice and fixed to said tine bar whereby said tine bar may be selectively laterally adjusted relative to said spiders, yet rotate relative thereto as required.

4,120,138

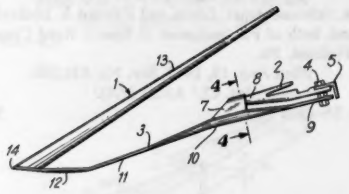
GRAIN LIFTER FOR THE CUTTER MECHANISMS OF HARVESTERS

Gustav Schumacher, II, and Gunter Schumacher, both of 5231 Eichelhardt Westerwald, Fed. Rep. of Germany

Filed Jul. 8, 1976, Ser. No. 704,024
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1975, 2531435
Int. Cl.[2] A01D 55/10
U.S. Cl. 56—313 8 Claims

1. For use with a harvester cutter mechanism which includes a mower guard finger having a front tip region and a mower

guard finger holder, a grain lifter comprising an elongated support leg having a rear upper region secured to said holder, a front lower region adapted to glide along the ground, an elongated intermediate region inclined rearwardly and upwardly from said front lower region, and a fourth elongated region situated between said intermediate and rear regions, a holder fixed to and extending upwardly from said forth region of said support leg and embracing said front tip region of said mower guard finger, said fourth region of said support leg having a cross section which provides said fourth region with



a rigidity sufficient to prevent yielding of said support leg at said fourth region thereof during operation of the harvester, while said rear upper region, front lower region, and elongated intermediate region of said support leg are made of a solid flat material which is springy and capable of yielding resiliently during operation of the harvester, said fourth region of said support leg being made of the same material as and being integral with the adjoining regions thereof but being transversely curved to have the configuration of an elongated channel of substantially U-shaped cross section to provide said fourth section with said rigidity.

4,120,139

CABLE MAKING APPARATUS

Shinichi Terasawa; Akitoshi Okamura; Shigeru Okuyama; Takehiko Nishiyama, and Tadao Nishida, all of Higashi-Osaka, Japan, assignors to Tatsuta Densen Kabushiki Kaisha, Osaka, Japan

Filed Jul. 25, 1977, Ser. No. 819,035

Claims priority, application Japan, Jul. 29, 1976, 51-91736

Int. Cl.[2] D01H *13/02, 13/04*

U.S. Cl. 57—13 **13 Claims**

1. In apparatus for assemblying a cable by laying outer strands around a core, wherein the apparatus is of the type including core pay-out means and cable take-up means rotatable in the same direction about a common, stationary first axis and further rotatable about revolving second axes transverse to the first axis for paying out the core and taking up the assembled cable, respectively, a plurality of outer strand pay-out means each rotatable about a stationary third axis and each further rotatable about a revolving fourth axis transverse to the third axis for paying out one of the outer strands, and a stationary laying die disposed on the first axis between the core pay-out means and the cable take-up means for closely receiving and passing therethrough the outer strands and the core so as to assemble for the former around the latter, the improvement which comprises means for guiding the core from the core pay-out means to the laying die substantially along the first axis, the core guiding means including means for smoothly transmitting a pre-twist, which is imparted to the core by the rotation of the core pay-out means about the first axis, through the length of the core from the core pay-out means to the laying die, and means for guiding each outer strand from one of the outer strand pay-out means to the laying die along a path having a curve therein, the outer strand guiding means including a series of interspaced linearly tapered rollers disposed along the curve in the path of each outer strand and held in engagement therewith, at least some of the tapered rollers being each set at an angle to the direction transverse to the axial direction of the outer strand being fed thereover, whereby a pretwist imparted to each outer strand by the rotation of one of the outer strand pay-out means about the third axis is smoothly transmitted through the length of the outer strand from the outer strand pay-out means to the laying die, and whereby the core and the outer strands can be assembled into the cable of improved characteristics.

4,120,140

METHOD AND DEVICE FOR JOINING A THREAD

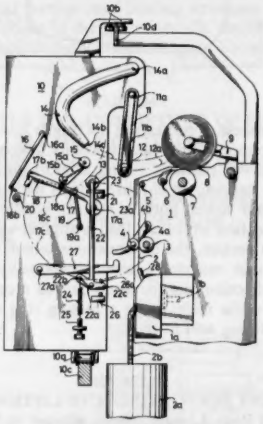
Hans Raasch, and Hans Grecksch, both of Monchengladbach, Germany, assignors to W. Schlafhorst & Co., Monchengladbach, Germany

Filed May 11, 1977, Ser. No. 795,736

Claims priority, application Fed. Rep. of Germany, May 11, 1976, 2620805

Int. Cl.[2] D01H *15/00*

U.S. Cl. 57—34 R **5 Claims**



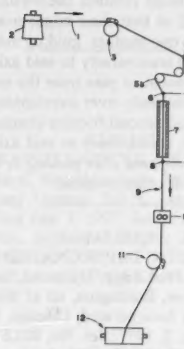
1. Method of joining a thread of a take-up coil at a spinning station of a rotor spinning machine having a normal travel course therethrough from the spinning rotor to the take-up coil for a thread that has been spun therein and having a thread draw-off device and a thread guide disposed in the normal travel course, the joining being effected by means of a traveling joining device having a thread draw-off device for drawing off a thread end from the take-up coil and having a thread delivery device for transferring the drawn-off thread end to the spinning rotor of the spinning station, the method comprising the steps of guiding a thread back from the take-up coil to the spinning rotor through the thread draw-off device of the joining device, which has been switched to reverse operation, and through the thread draw-off device of the spinning station which has been switched to idling operation, switching the thread draw-off device of the joining device to forward operation at an instant at which the thread is joined, switching on the thread draw-off device of the spinning station at an instant at which the thread draw-off devices of both the spinning station and the joining device are operating together, removing the thread from the thread draw-off device of the joining device by means of the thread delivery device and transfering the thread thereby to the normal travel course of the thread and to the thread guide in the spinning station against the action of a restoring force, and rotating the take-up coil during said transfer at a speed that is increased over the normal winding speed.

4,120,141

PROCESS AND APPARATUS FOR THE PRODUCTION OF TEXTURED POLYESTER YARN

George Lopatin, Newton Centre, Mass., and Menachem Lewin, Jerusalem, Israel, assignors to The State of Israel Ministry of Commerce and Industry, Jerusalem, Israel

Filed Jul. 27, 1977, Ser. No. 819,529
Int. Cl.[2] D02G *1/02*
U.S. Cl. 57—34 HS 20 Claims



1. A process for the simultaneous drawing and false-twist texturing of partially oriented polyester yarn, which comprises passing the yarn from a supply source, in succession, through:

a. a yarn feed system;

b. a heating zone wherein the yarn is heated to a temperature of from about 175° to about 235° C;

c. a heat-maintenance zone, wherein the yarn is maintained, for at least 0.05 secs. after the yarn leaves said heating zone, at a temperature below said temperature of the heating zone and from about 150° to about 190° C;

d. a cooling zone wherein the yarn is cooled to a temperature below about 80° C;

e. a false-twisting means;

f. take-up means which is effecting the drawing of the yarn in said temperature maintenance zone and cooling zone; and

g. winding-up means.

11. Apparatus for the simultaneous drawing and false-twist texturing of partially oriented polyester yarn, comprising in sequence:

a yarn feed system;

yarn heating means adapted to heat the yarn to a temperature of from about 175° to about 235° C;

heat maintenance means adapted to maintain the yarn at a temperature below said temperature of the heating means and between about 150° and about 190° C., for at least 0.05 secs.;

false-twisting means disposed at such a distance from said heat maintenance means so as to provide for an interposed cooling zone sufficient to allow the yarn to cool to a temperature below about 80° C before it reaches said false-twisting means;

a draw-roller system adapted to effect drawing of the yarn to the desired draw ratio; and

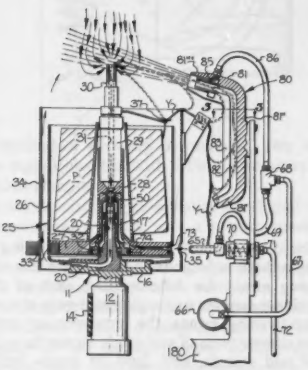
winding-up means.

4,120,142

YARN INJECTION MECHANISM FOR COOPERATION WITH PNEUMATIC YARN THREADING DEVICES OF A TEXTILE YARN PROCESSING MACHINE

Gustav Franzen, Willich, Fed. Rep. of Germany, assignor to Palitex Project Company GmbH, Krefeld, Fed. Rep. of Germany

Filed Oct. 17, 1977, Ser. No. 842,891
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1976, 2646921
Int. Cl.[2] D01H *15/00, 13/04*
U.S. Cl. 57—34 R 11 Claims



1. In a textile yarn processing machine, such as a two-for-one twister or the like, the combination of:

a plurality of spindle assemblies mounted in generally side-by-side relationship along the outside of said machine and each including a driven rotating rotor mechanism, a stationary carrier mechanism for carrying a hollow supply package of yarn, and an elongate yarn passageway extending downwardly through the top of said carrier mechanism along the axis of said spindle assembly and radially outwardly through said rotor mechanism for receiving the yarn from the supply package therethrough during yarn processing;

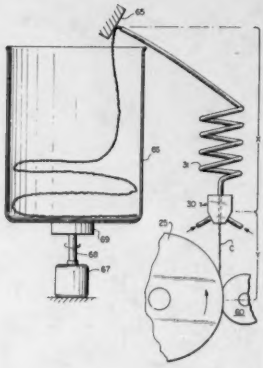
selectively-operable pneumatic threading mechanisms for being operated to automatically thread yarn withdrawn from the supply package through said yarn passageway during threading-up of said spindle assemblies by creating a suction through the yarn entry portion of said passageway and a positive air stream through the yarn exit portion of said passageway; and

pneumatic yarn injection means, operatively associated with said threading mechanisms of each of said spindle assemblies, for creating a suction extending therein for grasping and containing therein a free end of yarn extending outwardly from the supply package of yarn along the outside of said machine and for creating a positive air stream extending thereout for conveying and comletely releasing the grasped and contained free end of yarn therefrom to the entry portion of said yarn passageway through said spindle assembly for receipt by the suction created therethrough by said pneumatic threading mechanisms for effecting threading-up of said spindle assembly and to eliminate manual handling of the free end of yarn during such pneumatic threading-up of said spindle assembly.

4,120,143
FLUID SELF-TWIST SPINNING APPARATUS

Phillip W. Chambley, and Alan H. Norris, both of Rome, Ga., assignors to Champion International Corporation, Stamford, Conn.

Filed Oct. 25, 1977, Ser. No. 845,340
Int. Cl.[2] H01B 13/04
U.S. Cl. 57—34 AT 7 Claims

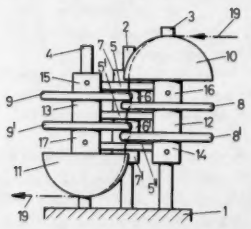


1. In combination with an apparatus for forming a plied self-twisted yarn from at least two singles yarn strands of the type comprising means for false-twisting each of the yarn strands and guide means for conveying said yarn strands away from said false-twisting means, the improvement comprising fluid jet means downstream of said guide means for promoting the plying of said strands, said fluid jet means including a source of fluid under pressure, a twist jet comprising a body having inlet means for selective connection to said source of fluid under pressure and a control yarn passage communicating with said inlet means, and an elongated coiled tube having an inlet end and an outlet end, the inlet end of said tube being connected to the outlet end of said passage to convey yarn away from said twist jet and being spaced from said guide means to define a plying region therebetween.

4,120,144
DEVICE FOR FRICTION FALSE-TWISTING OF TEXTILE YARNS OF SYNTHETIC MATERIAL

Gustav Brehm, Wattwil, Switzerland, assignor to Heberlein Maschinenfabrik AG., Wattwil, Switzerland

Filed Nov. 9, 1976, Ser. No. 740,081
Claims priority, application Switzerland, Nov. 24, 1975, 15115/75
Int. Cl.[2] D02G 1/04
U.S. Cl. 57—77.4 3 Claims

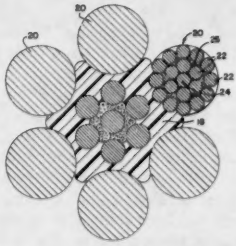


1. A device for friction false-twisting textile yarn comprising a support, three substantially parallel shafts mounted on said support with their axes, in plan view, at the corners of an equilateral triangle, each shaft mounted for rotation about its longitudinal axis, a first friction element presenting a convex surface of revolution about an axis fixed coaxially on one of said shafts, said first friction element being formed so that the axis of said one of said shafts intersects a convex end portion of said convex surface, a second friction element presenting a convex surface of revolution about an axis and fixed coaxially on a different one of said shafts, said second friction element being substantially similar to said first friction element and inverted relatively to said first friction element to present a convex end portion of its convex surface facing oppositely to said first mentioned end portion, said first and second friction elements being axially displaced from one another with respect to the axes of said plurality of shafts, a plurality of circular disc-like friction members distributed between and fixed coaxially to all three of said shafts between said first and second friction elements in spaced relation therewith, said disc-like members being formed so that their edges overlap in spaced relation with respect to one another, guiding means for guiding yarn to be false twisted transversely to said axis of revolution of said first friction element to pass over the convex end portion thereof and then sinuously over overlapping edges of said disc-like members to said second friction element, and guiding means for guiding yarn transversely to said axis of revolution of said second friction element after passing to the convex end portion of said second friction element.

4,120,145
LUBRICATED PLASTIC IMPREGNATED WIRE ROPE

Ferdinand Chiappetta; Fred Edgar Dykeman, both of Kenosha, and Paul Allen Turner, Burlington, all of Wis., assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed Aug. 3, 1977, Ser. No. 821,574
Int. Cl.[2] D07B 1/06, 1/16
U.S. Cl. 57—149 19 Claims



7. A wire rope comprising: a lubricated wire core; a plurality of wire strands laid around said core to define a wire rope of predetermined outside diameter; and a thermoplastic material filling the interstices between said core and said strands and between adjacent strands, said thermoplastic material forming a spacing between said strands and said core and between adjacent strands to hold said strands in a predetermined relationship to said core and to each other, said thermoplastic material extending radially outwardly to a point less than the outside diameter of said rope.

4,120,146
STRINGS FORMED AT LEAST PARTIALLY OF SYNTHETIC MATERIAL

Jacques André Robin, 125 boulevard Malesherbes, Paris, France

Filed Jun. 28, 1977, Ser. No. 810,881
Claims priority, application France, Jun. 29, 1976, 76 19684; May 31, 1977, 77 16536
Int. Cl.[2] D02G 3/36, 3/40
U.S. Cl. 57—162 14 Claims

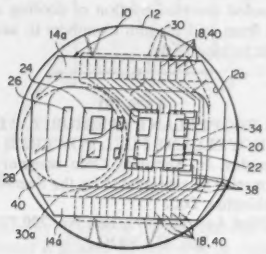
1. A process of manufacturing strings constituted at least in part of synthetic material, said process comprising the following steps:

(a) forming at least one bundle of multifilaments of material selected from the class consisting of synthetic and natural materials, the filaments being parallel one to another,
(b) impregnating all the multifilaments of said bundle with a thermosettable adhesive impregnation product having an appropriate elasticity when hardened,
(c) making said impregnation product prepolymerise up to a chosen degree of partial polymerisation,
(d) twisting said bundle while avoiding the drying out of its impregnated multifilaments thanks to the partial degree of polymerisation chosen for this twisting step and
(e) finally completing the polymerisation of said impregnation product to harden the same.

4,120,147
WATCH MODULE ASSEMBLY

Tomomi Murakami, Higashiyamoto, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Jan. 3, 1977, Ser. No. 756,561
Claims priority, application Japan, Jan. 8, 1976, 51-1765; Mar. 2, 1976, 51-22407
Int. Cl.[2] G04B *37/04*; G04C *3/00, 17/00*
U.S. Cl. 58—50 R **9 Claims**

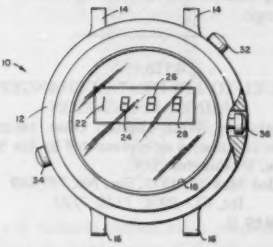


1. A watch module construction comprising:
an electrooptical display cell having first separate rows of electric contact terminals, said first rows being spaced from and parallel to one another;
a first support frame including means for retaining said display cell in a fixed place;
a second support frame fixedly connected to said first support frame;
a printed circuit substrate disposed on said second support frame and having second rows of electric contact terminals formed on said substrate with printed circuit leads formed thereon, said printed circuit leads being connected to said second rows of electric contact terminals and terminating on said substrate at an area displaced from a center of said first support frame;
an integrated circuit chip mounted on said area of said substrate and connected to said printed circuit leads;
compressible conductive rubber members disposed between said first and second rows of electric terminals to provide electrical connections therebetween; and a battery support plate disposed between said first and second support frames and adapted to support a battery thereon;
said second support frame and said substrate having cutouts formed at a position opposing said area with respect to the center of said first support frame to accommodate said battery in line with said integrated circuit chip on a plane parallel to said display cell.

4,120,148
LOGIC CIRCUIT FOR USE IN TWO OR THREE BUTTON DIGITAL WATCH

Norman E. Moyer, Newport Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 2, 1976, Ser. No. 710,494
Int. Cl.[2] G04B *27/00*
U.S. Cl. 58—85.5 **4 Claims**

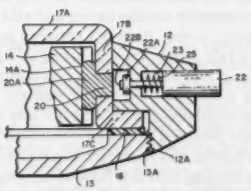


1. A method of allowing the same IC chip to be used in different digital watches with differing numbers of push buttons, which comprises:
(a) providing circuitry to initialize the digital watch's logic to operate as a watch with a predetermined number of push buttons when batteries are inserted into the watch case, the batteries permitting a predetermined number of push buttons to be operable; and
(b) providing circuitry to detect the depression of additional push buttons thereby causing the watch to function appropriately for the additional push buttons and permitting said additional push buttons to be operable.

4,120,149
ELECTRONIC WATCH

Richard Edward Ripley, Attleboro, Mass., assignor to Textron, Inc., Providence, R.I.

Filed Mar. 11, 1977, Ser. No. 776,710
Int. Cl.[2] G04B *37/00*
U.S. Cl. 58—88 R **6 Claims**



1. In an electronic watch comprising:
a back,
a bezel, and
an electronically controlled module for digitally displaying a time signal,
the improvement comprising,
a crystal comprising,
an upper member with its lower surface adjacent to the upper surface of said module,
a first flange extending downwardly from the edge of said upper member adjacent to the side of said module, and
a second flange extending laterally outwardly from the bottom of said first flange,
contact means having a longitudinal portion sealed into said first flange and an inner end portion which is electrically connected to said module,
a plunger mounted in a bore in said bezel, said plunger being

movable along the axis of said bore, whereby the inner end portion of the plunger is engagable with the outer end of said contact means and the outer end portion of said plunger is exposed for receiving pressure by the user to cause said engagement to occur,

a sealing member positioned between said second flange and an upper surface of said back, and

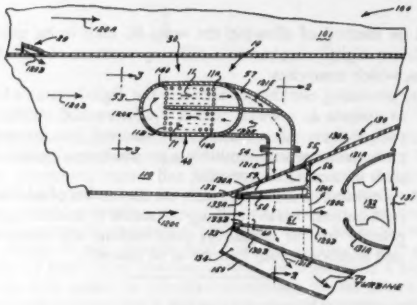
means for holding said upper surface of said back against said sealing member and said sealing member against said second flange.

4,120,150

COMPACT FUEL-TO-AIR HEAT EXCHANGER FOR JET ENGINE APPLICATION

Thomas G. Wakeman, West Chester, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 17, 1977, Ser. No. 797,669
Int. Cl.[2] F02C 7/18, 7/22
U.S. Cl. 60—39.09 R **5 Claims**



1. A compact fuel-to-air heat exchanger, in combination with a gas turbine engine having: a hot flow of cooling air; an air duct in communication with said hot flow of cooling air; a combustor section also in communication with said hot flow of cooling air and having a combustor, a combustor dome, a diffuser, and an outward combustor section casing, wherein said outward combustor section casing and said air duct define a fire safety cavity; means, disposed between said air duct and said defined fire safe cavity, for ventilating said fire safe cavity; and, a cool flow of fuel for and to said combustor; wherein said heat exchanger is disposed internal of said gas turbine engine and within said ventilated and defined fire safe cavity, and also is simultaneously disposed near said combustor dome and said diffuser, and wherein said heat exchanger comprises:

a. means for cooling said hot flow of cooling air;

b. means for heating said cool flow of combustor fuel, with this said means in association with said cooling air cooling means;

wherein said means for cooling and said means for heating include, in common, a plurality of flow tubes through which said combustor fuel flows, with said flow tubes disposed in a crossflow relationship with and to said hot flow of cooling air, and with said fuel flow tubes having a common fuel inlet manifold and a common fuel outlet manifold;

and whereby heat is transferred from said hot flow of cooling air to said cool flow of combustor fuel, thereby resulting in an exhaust flow of cooled cooling air;

c. and, means for manifolding, and for directing flow of, said hot flow of cooling air and said exhaust flow of cooled cooling air, wherein said cooling air manifolding and flow-directing means includes:

(1) an inlet, in said combustor section, into which said hot flow of cooling air enters;

(2) means, associated with said inlet, for diverting a portion of said hot flow of entering cooling air;

(3) a casing, housing said plurality of combustor fuel flow tubes;

(4) a first plurality of conduits, leading from said diverting means to said casing, and connected to said diverting means and said casing, to direct said diverted portion of hot flow of cooling air to said casing, and to said plurality of combustor fuel flow tubes housed therein, whereby said diverted portion of said hot flow of cooling air is cooled;

(5) a plurality of air manifolds interposed between and connected to said diverting means and said first plurality of conduits, with one air manifold for each conduit, wherein each air manifold has a plurality of intake air holes therein through which flows said diverted portion of hot flow of cooling air from said diverting means to said air manifold;

(6) a second plurality of conduits, connected to and leading from said casing, to direct and to exhaust said cooled diverted portion of cooling air flow from said casing, and from said plurality of combustor fuel flow tubes housed therein, to a plurality of plenum chambers, with one plenum chamber for each conduit of said second plurality, wherein each plenum chamber is defined by a baffle and a wall of said diffuser;

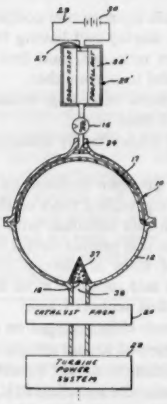
(7) and, a third plurality of conduits, connected to and leading from said plenum chambers through said diffuser and into a duct defined by a casing for said combustor section and a rotor drum, with said duct leading to said hot turbine and said hot turbine parts, whereby said cooled diverted portion of cooling air flow is directed from said plenum chambers to said hot turbine and hot turbine parts.

4,120,151

SOLID PROPELLANT PRESSURIZATION OF MONOPROPELLANT FUEL POWERED SYSTEM

Richard E. Quigley, Jr., Kettering, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 25, 1977, Ser. No. 790,773
Int. Cl.[2] F02C 1/04
U.S. Cl. 60—39.46 M **1 Claim**



1. In an auxiliary power unit having a turbine adapted to supply power to a load, an expulsion tank including a movable flexible bladder, secured to the wall of said tank; a monopropellant within said tank on one side of said bladder; an outlet in said tank on the side of said bladder adjacent said monopropellant; means, within said outlet, for retaining the monopropellant within said tank until the pressure in said tank reaches a

predetermined level; a catalyst pack connected between said tank outlet and said turbine; said catalyst pack including means for decomposing the monopropellant to provide a turbine drive gas; apparatus for pressurizing said positive expulsion tank; comprising: a solid propellant cartridge including a sodium azide solid propellant; means for connecting said solid propellant cartridge to said positive expulsion tank on the side of said bladder remote from said monopropellant; a pressure regulation valve connected between said solid propellant cartridge and said positive expulsion tank; means, in said positive expulsion tank, for preventing direct impingement of gas from the solid propellant cartridge onto said bladder; means adjacent the outlet of said positive expulsion tank for puncturing the flexible bladder to admit the positive expulsion tank pressurizing gas to the catalyst pack to flush monopropellant products from the catalyst pack.

4,120,152

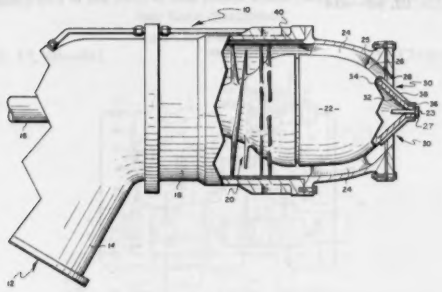
ANTI-VORTEX PINTLE

Eugene D. Jackson, III, Canoga Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 15, 1977, Ser. No. 777,732

Int. Cl.[2] B63H *11/00*

U.S. Cl. 60—221 **1 Claim**



1. A high velocity axial flow pump apparatus wherein flow leaving an inducer is guided through a large diameter annulus formed by an outer housing and a center pintle body to a smaller nozzle discharge diameter by a stator, pintle, nozzle combination, the improvement which comprises:

at least one substantially axially aligned, radially extended guide vane affixed to said pintle, a first end of said guide vane being affixed to said pintle near the downstream exit of said stator, a second end of said guide vane is affixed to and terminated substantially at the discharge end of said pintle body adjacent said nozzle, said guide vanes being low profile, said guide vanes protruding beyond the surface of said pintle in a radially outward direction towards said surrounding pump housing a distance one-half or less the annulus between said pintle and said housing a minimize frictional drag and nozzle blockage of the outflowing fluid, said guide vane serving to substantially eliminate tangential whirl of fluid prior to the fluid exiting said nozzle.

4,120,153

SOLID PROPELLANT GAS GENERATING DEVICE

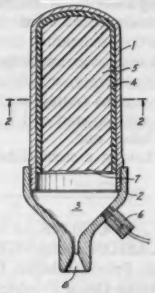
Otto G. Schaffling, Cheshire, Conn., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 143,274, Oct. 2, 1961, Pat. No. 3,947,523. This application May 21, 1964, Ser. No. 373,125

Int. Cl.[2] F02K *9/04*

U.S. Cl. 60—255 **8 Claims**

1. In combination with a vessel forming a rocket motor combustion chamber, a rubber-base liner firmly adhering to the interior chamber wall, said rubber-base liner containing between about 2.5 and 30 percent by weight of an inorganic metal salt selected from the group consisting of zinc chromate, barium chromate, zinc phosphate, lead phosphate, potassium



phosphate, and mixtures thereof, and a propellant charge substantially filling the lined portion of the chamber, said propellant charge firmly adhering to said liner.

4,120,154

INTERNAL COMBUSTION ENGINE

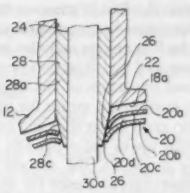
Akira Yokota, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Apr. 8, 1976, Ser. No. 674,767

Claims priority, application Japan, Apr. 22, 1975, 50-54915[U]

Int. Cl.[2] F01N *3/10*; F02B *23/00*

U.S. Cl. 60—282 **1 Claim**



1. In an exhaust system for an internal combustion engine:

an exhaust manifold having at least one manifold passage;

a cylinder head having at least one exhaust discharge opening at which said cylinder head is connected to said manifold passage, at least one exhaust intake opening and at least one exhaust port bore extending from said exhaust discharge opening to said exhaust intake opening, said cylinder head having wall means defining said exhaust port bore and a valve guide receiving bore having one end opening outward of said cylinder head and an opposite end opening to said exhaust port bore;

a double-walled port liner formed by an inner metal tube and an outer metal tube, said outer metal tube surrounding said inner metal tube and cooperating with same to form a space therebetween, said inner metal tube defining an exhaust flow passage,

said double-walled port liner being fixedly mounted within said exhaust port bore so that a second space is formed between said outer metal tube and said wall means,

said first mentioned space surrounding substantially all of the outer surfaces of said inner metal tube, being closed at an area adjacent said exhaust intake opening, and being open to said manifold passage at an area adjacent said exhaust discharge opening,

said second space surrounding substantially all of the outer surfaces of said outer metal tube, being closed at the area

adjacent said exhaust intake opening, and being open to said manifold passage at the area adjacent said exhaust discharge opening.

a valve guide having a sleeve portion fixedly received in said valve guide receiving bore, said valve guide having a tapered end portion extending into said exhaust flow passage through said outer and inner metal tubes having seal portions, respectively, which are bent toward said exhaust flow passage to contact said tapered end portion to seal between said tapered end portion and said outer and inner metal tubes; and

an exhaust valve having a stem slidably received in said valve guide.

4,120,155

PROPULSION ARRANGEMENT

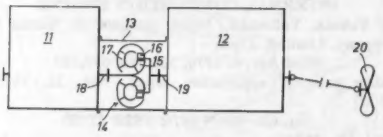
Herbert Deutschmann, Friedrichshafen, Germany, assignor to Motoren- und Turbinen-Union Friedrichshafen GmbH, Germany

Filed Oct. 4, 1976, Ser. No. 729,181

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1975, 2545665

Int. Cl.² F02B *37/00, 73/00*

U.S. Cl. 60—599 **45 Claims**



1. A propulsion arrangement including two diesel engines, characterized in that the first of the two engines has means for producing a predetermined compression ratio which ensures a reliable starting, the first engine includes an exhaust gas-driven supercharger means and fuel injection means for providing an optimal partial load operation of the engine, and in that the second of the two engines has means for producing a predetermined compression ratio lower than the ratio of the first of the two engines, which lower ratio permits high supercharging and high average pressures, the second engine includes an exhaust-driven supercharger means for delivering high supercharging pressure in full load operation of the second engine, and in that means are provided for supplying surplus exhaust from the first engine to the second engine to prepare an air charge of the second engine for reliable ignition conditions in partial load operation of the second engine.

4,120,156

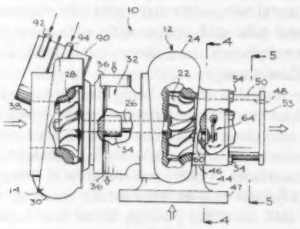
TURBOCHARGER CONTROL

Charles E. McInerney, Rolling Hills Estates, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Jun. 8, 1977, Ser. No. 804,687

Int. Cl.² F02D *23/00*

U.S. Cl. 60—602 **20 Claims**



1. A turbocharger comprising a turbine housing and a compressor housing each having a gas inlet and a gas outlet, said turbine housing having a bleed hole formed therein opening into said gas inlet, said bleed hole and said gas outlet being formed in a common end surface on said turbine housing; a turbine wheel and a compressor wheel disposed within said turbine housing and said compressor housing, respectively, and mounted for simultaneous rotation on a common shaft; a gas discharge housing mounted in operative association with said turbine housing matingly engaging said end surface to extend over the bleed hole and gas outlet, said discharge housing having a gas discharge passage communicating with the gas outlet of said turbine housing, and a bypass chamber communicating between the discharge passage and the bleed hole; and valve means movably mounted on said discharge housing for seating on said turbine housing end surface to selectively close the bleed hole.

4,120,157

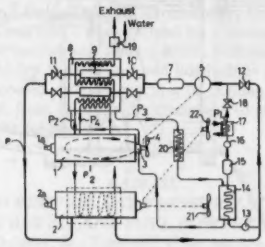
POWER GENERATING AND AIR CONDITIONING SYSTEM UTILIZING WASTE HEAT

Mou-Lin Tang, No. 18-3, Alley 133, Lane 100, Tung Yuan St., Taipei, Taiwan

Filed Mar. 2, 1977, Ser. No. 773,479

Int. Cl.² F01K *23/10*

U.S. Cl. 60—618 **7 Claims**



1. Power generating and air conditioning system having an internal combustion engine, a vapor engine having a rotor inside and a refrigerant cycling circuit, said system comprising:

(a) a power generating refrigerant circuit including in series:

a refrigerant pump;

a receiver;

a heat exchanger having at least two accumulating chambers disposed therein and connected in parallel with each other, each of said chambers having a check valve at its inlet to permit the entry of low pressure refrigerant from said receiver and each of said chambers having a release valve at its outlet to prohibit the exit of said refrigerant until it had reached a predetermined working pressure; and,

a vapor engine disposed successively along the flow direction of the refrigerant and arranged in order by related piping to return said refrigerant to said refrigerant pump

(b) an air conditioning cooling circuit having one end connected to the outlet side of said vapor engine and having the other end connected to the suction end of said refrigerant pump and operative to bypass a portion of said refrigerant from said power generating circuit to produce a cooling effect and then to return said refrigerant to said power generating circuit said cooling circuit including in series:

condenser means;

liquid storage means for storing the condensed refrigerant;

evaporation means for evaporating said refrigerant and thereby absorbing heat from a space desired to be cooled

(c) means for introducing waste heat of said internal combus-

tion engine into said heat exchanger to elevate said refrigerant to a predetermined working pressure in said accumulating chambers;

(d) means for operating each of said accumulator check valves and each said accumulator release valves alternatively in sequence to release refrigerant accumulated at a working pressure alternatively from successive accumulating chambers to provide a substantially continuous flow of refrigerant to operate said vapor engine whereby the waste heat of said internal combustion engine is exchanged through said heat exchanger with said refrigerant inside said exchanger and said refrigerant is thereby elevated to a predetermined working pressure in said accumulating chambers and part of said refrigerant is released into said vapor engine to drive the rotor thereof through expansion of the refrigerant to generate power and part of said refrigerant is introduced to said cooling circuit to be condensed and evaporated to produce a cooling effect.

4,120,158

POWER CONVERSION AND SYSTEMS FOR RECOVERING GEOTHERMAL HEAT

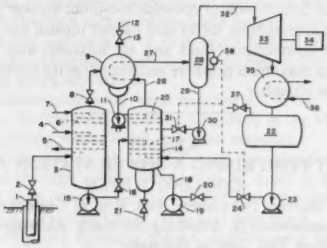
Itzhak Sheinbaum, 2038 E. Altadena Dr., Altadena, Calif. 91101

Filed Nov. 15, 1976, Ser. No. 741,646

The portion of the term of this patent subsequent to Nov. 2, 1993, has been disclaimed.

Int. Cl.[2] F03G *7/00*

U.S. Cl. 60—641 **16 Claims**



1. The process of recovering heat from geothermal fluid which may contain salt, non-condensables and dissolved minerals comprising the steps of:

separating the liquid geothermal fluid from the gaseous geothermal fluid;

heating a working fluid in a first heat exchange relationship by direct contact heat exchange with the separated geothermal liquid;

transforming at least a portion of the working fluid to a gaseous state by further heating the preheated working fluid in a second heat exchange relationship with the separated gaseous portion of the geothermal fluid; and

expanding the gaseous working fluid in a power extraction gas expansion device.

4,120,159

STEAM TURBINE CONTROL SYSTEM AND METHOD OF CONTROLLING THE RATIO OF STEAM FLOW BETWEEN UNDER FULL-ARC ADMISSION MODE AND UNDER PARTIAL-ARC ADMISSION MODE

Hiroshi Matsumoto; Yoshiyuki Nakano; Toshihiko Higashi, and Akihiro Yasumoto, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 19, 1976, Ser. No. 734,017

Claims priority, application Japan, Oct. 22, 1975, 50-126398; Mar. 26, 1976, 51-32615

Int. Cl.[2] F22D *1/12*

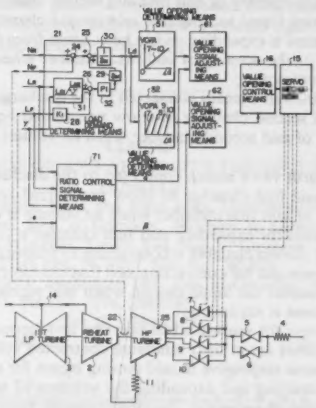
U.S. Cl. 60—667 **8 Claims**

1. In a steam turbine control system having a turbine and a plurality of valves operable to admit steam to a first stage of the turbine through a nozzle arc, the combination of:

means for generating a load demand signal according to a speed reference signal, speed feed-back signal, load reference signal, load feed-back signal, and load change rate signal:

means for generating a first valve opening signal under a full arc admission mode according to said load demand signal;

means for generating a second valve opening signal under a partial arc admission mode according to said load demand signal;



means for generating first and second ratio control signals between steam flow under the full arc admission mode and steam flow under the partial arc admission mode according to the load reference signal, the load feed-back signal, the load change rate signal, and a first stage temperature change rate signal;

means for adjusting the said first valve opening signal according to said first ratio control signal;

means for adjusting the said second valve opening signal according to said second ratio control signal; and

load control means arranged to position said valves to admit a desired total steam flow to said turbine according to the adjusting valve opening signals.

4,120,160

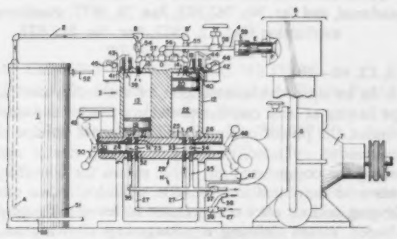
POWER GENERATION SYSTEM

Rock Davis, P.O. Box 6, Symsonia, Ky. 42082

Filed Mar. 2, 1977, Ser. No. 773,487

Int. Cl.[2] F01K *23/00*

U.S. Cl. 60—670 **14 Claims**



11. In a power generation system having a low pressure source of liquid, means connected to said source for pressurizing said liquid to a substantially high pressure, means for forming vapor from said pressurized liquid, and turbine means for

deriving mechanical motion from said vapor, the improvement wherein said pressurizer comprises:

(a) wall means defining first and second chambers having variable volumes, each chamber having an intake and discharge opening;

(b) first valve means between said source of liquid and the intake openings of said first and second chambers for permitting liquid to flow into said first chamber when its volume is expanding and to keep liquid from flowing into the intake opening of said second chamber when its volume is contracting;

(c) second valve means between said source of liquid and the intake opening of said first and second chambers for permitting liquid to flow into said second chamber when its volume is expanding and to keep liquid from flowing into the intake opening of said first chamber when its volume is contracting;

(d) third valve means connected to the discharge opening of said second chamber to allow pressurized liquid to flow out of said second chamber when its volume is contracting;

(e) fourth valve means connected to the discharge opening of said first chamber to allow pressurized liquid to flow out of said first chamber when its volume is contracting;

(f) means for expanding said first chamber's volume when said second chamber is contracting to pressurize the liquid therein and for contracting said first chamber's volume to pressurize the liquid therein when said second chamber's volume is expanding;

(g) means for sensing when said first and second chambers' volumes are at their minimum contracted volume;

(h) means responsive to said sensing means for alternatively contracting and expanding the volumes of said first and second chambers so that low pressure liquid is flowing into the intake opening of said first chamber when relatively high pressure liquid is flowing out of the discharge opening of said second chamber, and so that low pressure liquid is flowing into the intake opening of said second chamber when relatively high pressure liquid is flowing out of the discharge opening of said first chamber; and

(i) pipe means connected to said third and fourth valve means (d and e), said pipe means being adapted to conduct pressurized liquid to a slide valve means connected to said means for forming vapor; said slide valve means having wall means to define a valve chamber and a multiplicity of orifices through which pressurized liquid is injected into said vapor forming means, said slide valve means having an element slidably mounted in said valve chamber, whereby said slide valve is alternatively opened and closed due to pressure differences between said pressurized liquid entering said slide valve and the vapor formed from said injected liquid.

4,120,161
EXTERNAL HEAT ENGINE

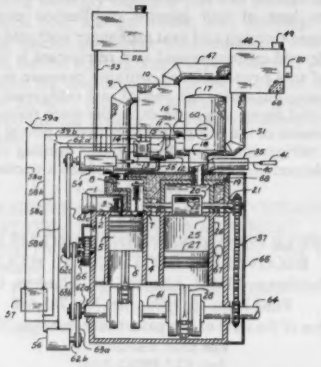
Reinhold C. Gedeit, 613 Beloit Ave., Forest Park, Ill. 60130

Continuation-in-part of Ser. No. 642,361, Dec. 19, 1975, abandoned, and Ser. No. 763,302, Jan. 28, 1977, abandoned. This application Oct. 12, 1977, Ser. No. 841,577

Int. Cl.[2] F02G 1/02

U.S. Cl. 60—682 **7 Claims**

1. In an open cycle air engine of the reciprocating piston type having at least one compression cylinder and one power cylinder, the power cylinder being of larger volume than the compression cylinder, said engine having heater means for heating the compressed air, valve means for admitting atmospheric air into said compression cylinder, valve means for allowing said air after compression to leave said compression cylinder, means defining a passageway allowing said compressed air to enter said air heater, valve means for admitting said compressed and heated air into said power cylinder, valve means for allowing the expanded and cooled down air to leave said power cylinder after the power stroke is completed, a housing for said valve means, a cylinder cooling system, and insulating means around all hot parts of the engine facing the outside, the improvements comprising in combination, means defining a hot air reserve chamber for allowing the heated and compressed air to expand under constant pressure, means defining a passageway between said air heater means and said hot air reserve chamber, means defining a passage from said hot air reserve chamber to said valve housing for admitting



said hot compressed air into said power cylinder, said air heater including a fuel feed control means, burner means for continuous combustion of combustible fliud, blower means for supplying atmospheric air to said burner means, and means to ignite the combustible fluid and air mixture; and means to control the maximum pressure and temperature within said hot air reserve chamber.

4,120,162
PLANT COMPRISING A POWER STATION AND A COOLING TOWER

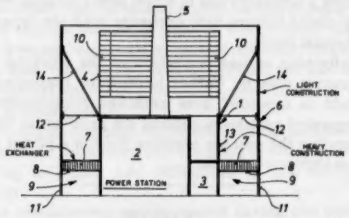
Hermann Heeren, Nuremberg, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Filed Nov. 10, 1976, Ser. No. 740,727

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1975, 2550527

Int. Cl.[2] F01K 9/00

U.S. Cl. 60—690 **6 Claims**



1. A plant, especially steam power plant, which includes: a power station with power station buildings having outer walls of a heavy weight conventional construction and with a cooling tower forming a double mantle construction surrounding said power station buildings and comprising in combination an inner cooling tower section and an outer cooling tower section surrounding said inner cooling tower section in spaced relationship thereto, the outer walls of said power station buildings forming at least a portion of said inner cooling tower section, and at least a portion of said outer cooling tower sections being of a light weight construction, any portion of said inner cool-

ing tower section extending upwardly from said power plant buildings rests on said power plant buildings, supporting means associated with said outer cooling section for resting the latter on the ground, and wind bracing means likewise associated with said outer cooling section and resting said outer cooling section on said power plant buildings.

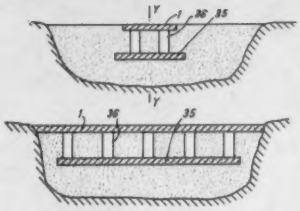
4,120,163
SOIL TREATMENT

Hisashi Shiraki, Fuchu, Japan, assignor to Kitagawa Iron Works Co., Ltd., Japan

Continuation of Ser. No. 610,217, Sep. 4, 1975, abandoned. This application Jul. 1, 1977, Ser. No. 812,930

Int. Cl.[2] E02D *3/12*

U.S. Cl. 405—264 **2 Claims**



1. A method, for the treatment of weak soil to provide stabilized land, comprising the steps of:

(i) moving an agitating means within said weak soil in a first lateral direction and simultaneously up and down so as to obtain the agitation of a first layer having length and breadth and having a depth corresponding to the extent of up and down movement,

(ii) simultaneously with said movement of the agitating means, feeding to the soil being agitated in the vicinity of the agitating means a soil stabilizer material,

(iii) repeating steps (i) and (ii) with the agitating means moved through a different portion of depth in the weak soil so as to obtain a second layer of treated soil spaced in the up or down direction from said first layer,

(iv) moving said agitating means, simultaneous feeding of said soil stabilizer material, up or down from the position of said first layer to the position of said second layer but without lateral movement, thereby to form a column of stabilized soil integral with both of said layers,

steps (iii) and (iv) being in either order.

4,120,164
UNDERGROUND ROADWAY OR TUNNEL SUPPORT

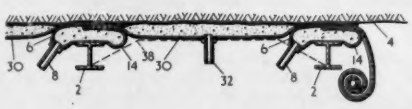
Malcolm George Tomlin, Burton-on-Trent, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Jul. 28, 1977, Ser. No. 820,064

Claims priority, application United Kingdom, Aug. 4, 1976, 32452/76

Int. Cl.[2] E21D *17/00*

U.S. Cl. 405—289 **10 Claims**



1. A method of supporting an underground roadway or tunnel comprising installing a series of spaced rigid support members along the roadway or tunnel, the rigid support member being erected in turn adjacent to newly exposed mine or rock surface as the roadway or tunnel is extended, locating deformable container means in at least portions of voids existing between the erected rigid support members and adjacent portions of the mine or rock surface, filling the deformable container means with flowable material such that the deformable container means is urged into contact with said adjacent portions of the mine or rock surface filling at least portions of the voids which previously existed between the rigid support members and the adjacent portions of the mine or rock surface and extending deformable limb means associated with the last installed deformable container means towards a newly erected rigid support member such that the limb means is inserted between the newly erected rigid support member and an adjacent portion of the mine or rock surface and is retained in the extended position when the next installed deformable container means associated with said newly erected rigid support member is filled with flowable material.

4,120,165
METHODS OF AND APPARATUS FOR DRIVING TUNNELS

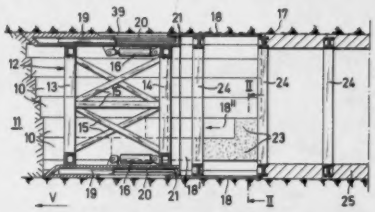
Dieter Stuckmann, Selm, and Hans Jütte, Dortmund-Brechten, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Feb. 11, 1977, Ser. No. 767,930

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1976, 2605741; Feb. 13, 1976, 2605740

Int. Cl.[2] E01G *3/02*

U.S. Cl. 405—145 **20 Claims**



1. In a method of driving a tunnel or the like which utilizes a drive shield with a plurality of drive members individually displaceable and supported by frame means, and elongated rear tail members associated and movable with the drive members, creating a lining for the tunnel to the rear of the drive shield, characterized by:

(a) successively advancing the elongated rear tail members, and

(b) introducing concrete in successive strips into the spaces left as the elongated rear tail members are successively advanced.

4,120,166
CEMENT MONITORING METHOD

Fred A. Brooks, Jr., Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Mar. 25, 1977, Ser. No. 781,087

Int. Cl.[2] E02B *17/00*

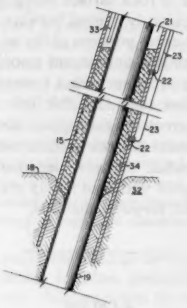
U.S. Cl. 405—225 **3 Claims**

1. In the cementing of an offshore tubular support member having a pile positioned therein, a method for determining the degree of set of the cement, which comprises:

(a) securing a probe capable of measuring the electrical resistance of fluid at a fixed elevation in the annulus defined by said support member and said pile,

(b) upwardly displacing fluid in said annulus with a cement slurry until said slurry reaches an elevation above said

probe as indicated by a change in the electrical resistance measured by said probe, and



(c) monitoring the electrical resistance of said cement slurry measured by said probe for a time period sufficient to indicate set of the cement.

4,120,167

OFFSHORE PIPE LAYING

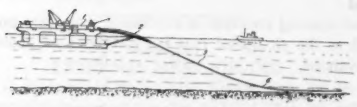
Lee Richard Denman, P.O. Box 52891, Houston, Tex. 77052, and William Randolph Abrams, Box 312, Mystic, Conn. 06355

Filed Jun. 6, 1977, Ser. No. 803,888

Claims priority, application United Kingdom, Jun. 17, 1976, 25172/76

Int. Cl.[2] F16L *1/00*; G01S *9/66*

U.S. Cl. 405—157 **10 Claims**



1. A method of laying pipeline offshore, comprising driving a pipe-laying barge along a predetermined right-of-way, feeding a continuous length of pipe from the barge to the underlying marine bottom so that the pipe is laid approximately along a predetermined path in the right-of-way, driving a vessel substantially over and along the track of the pipe as laid, ascertaining, by means of an echo sounder, the position of the touch-down point of the pipeline, computing the lateral deviation of the touch-down point from the predetermined path, and controlling the lateral displacement of the pipe-laying barge in accordance with the computed deviation of the touch-down point from the path so as to reduce the aforementioned deviation.

4,120,168

APPARATUS FOR LAYING A PIPELINE IN A BODY OF WATER

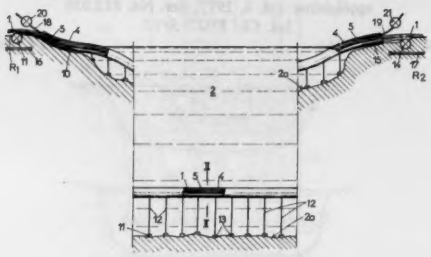
Jacques Edouard Lamy, Fontenay-aux-Roses, France, assignor to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C.G. Doris", Paris, France

Continuation-in-part of Ser. No. 690,873, May 28, 1976, Pat. No. 4,052,862. This application Jul. 14, 1977, Ser. No. 815,729

Claims priority, application France, May 30, 1975, 75 16962; May 13, 1976, 76 14432

Int. Cl.[2] F16L *1/00*

U.S. Cl. 405—170 **13 Claims**



1. Apparatus for use in laying a pipeline on the bed of a body of water, comprising:

(a) a pipeline, a ballast tube enclosing the pipeline over the whole of its length so that an intermediate space is created between the pipeline and the ballast tube, and means keeping the pipeline inside the ballast tube to form therewith an integral assembly adapted to be laid in the body of water;

(b) a supply of liquid less dense than water, and means for filling the intermediate space with said liquid, to give the assembly a positive buoyancy while said assembly is being laid in the body of water; and

(c) a supply of a medium denser than said liquid, and means for filling the intermediate space with said medium and recovering said liquid, once said assembly has been laid in the body of water to give the assembly a negative buoyancy whereby said assembly rests on said bed.

4,120,169

MULTIPHASIC PUMP FOR ROTATING CRYOGENIC MACHINERY

Phillip William Eckels, Pittsburgh, Pa., assignor to Electric Power Research Institute, Palo Alto, Calif.

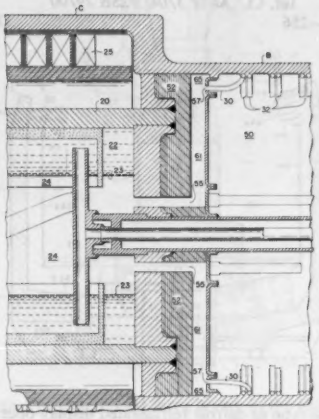
Filed Dec. 15, 1976, Ser. No. 750,794

Int. Cl.[2] F17C *7/02*

U.S. Cl. 62—55 **4 Claims**

1. A mixed phase pump for rapidly rotating cryogenic machinery which machinery includes a rapidly rotating support cylinder rotated substantially about its axis containing a two-phase liquid-gas refrigerant with said liquid normally classified to the periphery of said support cylinder to define a cylindrical pool and said gas classified to the interior of the refrigerant to define a gaseous refrigerant core with a cylindrical liquid gas interface therebetween, said support cylinder including said pump for withdrawing gaseous refrigerant from said pool, and means for communicating liquid refrigerant to said pool, said pump comprising: a pump housing, said pump housing rotatable about an axis substantially coincident to the axis of said refrigerant support cylinder; said pump housing defining at least one passageway extending from a first end adjacent the axis of rotation of said pump housing to an opposite end radially remote from the axis of rotation of said pump housing; a gaseous helium inlet communicated to said gaseous refrigerant core at one end and to said axially adjacent portion of said passageway at the opposite end to provide for the inflow of gaseous refrigerant from said core to said pump; a gaseous

refrigerant outlet removed axially outward from said inlet, said outlet communicating to said pump passageway at a distance less than the full radially outward distance of said passageway to permit the outflow of helium gas from said pump; and, said



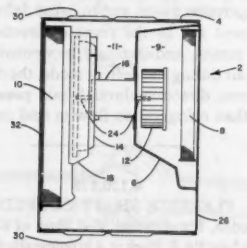
passageway defining between said outlet and the axially remote portion of said passage a liquid refrigerant storage volume to prevent liquid that penetrates in said inlet from gaining access to said pump outlet.

4,120,170

APPARATUS FOR REDUCING CONDENSATE NOISE IN AN AIR CONDITIONER

Robert J. Whitwell, Syracuse, and Theodore S. Bolton, Liverpool, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 4, 1977, Ser. No. 784,103
Int. Cl.[2] F25B *47/00*
U.S. Cl. 62—91 **7 Claims**



1. Apparatus in an air conditioning unit for reducing condensate noise which comprises:
- an evaporator section wherein condensate is formed;
- a condenser section having an axial condenser fan;
- means for powering the fan;
- fluid transfer means, whereby condensate is transferred from the evaporator section of the unit to the condenser section of the unit;
- slinger means communicating with the condensate in the condenser section of the unit; and
- a condenser fan shroud encasing the condenser fan having an orifice acting as an air flow guide and further having a curvilinear baffle forming a splash surface closely fitted to the slinger means whereby the splash surface is provided so that the condensate thrown by the slinger means strikes the splash surface at an acute angle.

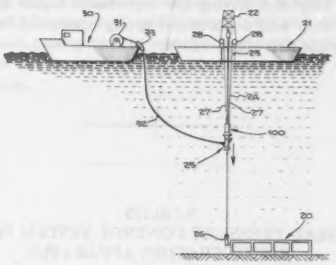
5. A method for reducing operating noise in an air conditioning unit having an evaporator section where condensation is formed, a condenser section having an axial condenser fan and having means for powering the fan which comprises:
- transferring the condensation from the evaporator section of the unit to the condenser section of the unit;
- slinging the condensation from the condenser section of the unit into the condenser fan air stream;
- encasing the axial condenser fan with a condenser fan shroud defining a condenser fan orifice which acts as an air flow guide; and
- enclosing the means for slinging the condensation with a closely spaced curvilinear baffle having a splash surface which the condensate impacts at an acute angle.

4,120,171

APPARATUS AND METHOD OF CONNECTING A FLEXIBLE LINE TO A SUBSEA STATION

Georges M. Chateau, Pau, France, and Chester B. Falkner, Jr., Huntington Beach, Calif., assignors to Societe Nationale Elf Aquitaine (Production), France

Filed Jan. 13, 1977, Ser. No. 759,031
Int. Cl.[2] F16L *1/04*
U.S. Cl. 405—169 **12 Claims**

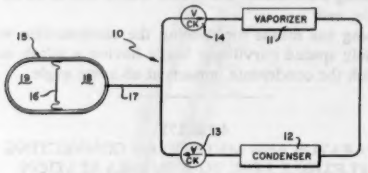


1. In a system for connecting a line having a connector on one end thereof to a subsea station having guide post means thereon, said guide post means being connected to guide lines leading to a first vessel positioned above said subsea station, said line to be connected being carried by a second vessel, the combination of:
- a connector guide frame means cooperable with said guide lines for movement between said guide post means and said first vessel;
- said connector guide frame means including socket means, said socket means having means for receiving and connecting thereto said connector on said one end of said line carried by said second vessel while said guide frame means is at the surface at said first vessel;
- and guide sleeve means carried by the connector guide frame, slideably cooperable with said guide lines, and releasably cooperable with said guide post means whereby said connector guide frame means is adapted to be lowered to said subsea station along said guide lines;
- means mounting said socket means on said connector guide frame means for pivotal movement in selected angular relation to said guide frame means whereby said connecting means with one end of said line attached thereto being yieldable relative to said connector guide frame means during lowering of said connector guide frame means to said subsea station;
- and means for locking said socket means in a preselected position when said connector guide frame means is at said subsea station;
- said socket means and said connecting means permitting connection of said connector with a means to be connected to said one end of said line when said guide frame means is at said preselected position at said subsea station.

4,120,172
HEAT TRANSPORT SYSTEM

Bill L. Pierce, Pittsburgh, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 5, 1977, Ser. No. 794,296
Int. Cl.[2] F25B *1/00*; F25D *15/00*
U.S. Cl. 62—115 4 Claims

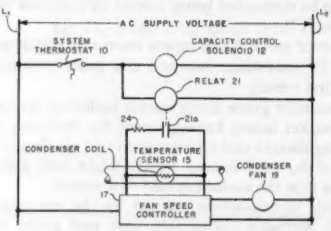


4. A method of transporting heat from a heat source to a heat sink over a considerable distance comprising vaporizing a vaporizable liquid in the nucleate boiling mode with heat from the heat source, condensing the vapors thus produced by rejecting heat to the heat sink, returning the condensate to the vaporizer through two check valves in series to complete a coolant loop and driving the vaporizable liquid around the coolant loop with a pneumatic spring connected to the loop between the two check valves.

4,120,173
HEAD PRESSURE CONTROL SYSTEM FOR REFRIGERATION APPARATUS

Francis Alfred Kimpel, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jun. 2, 1977, Ser. No. 802,689
Int. Cl.[2] F25B *39/04*
U.S. Cl. 62—181 11 Claims



1. In a refrigeration system having full capacity and reduced capacity operating modes, and which includes an air-cooled condenser, a head pressure control system comprising:

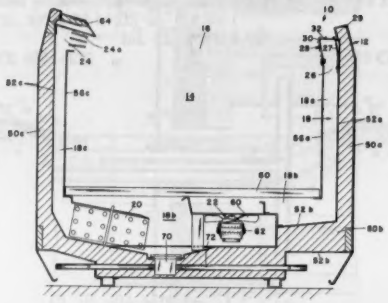
control means, operable when the refrigeration system is established in its full capacity operating mode, for maintaining the condenser pressure in said refrigeration system relatively constant at a first control point despite wide variations in condenser cooling air temperature;

and modifying means for altering the operation of said control means, when the refrigeration system is established in its reduced capacity operating mode, to maintain the condenser pressure relatively constant at a second control point, substantially lower than said first control point, despite wide variations in condenser cooling air temperature.

4,120,174
AIR DEFROST DISPLAY CASE

William C. Johnston, Atlanta, Ga., assignor to Kysor Industrial Corporation, Cadillac, Mich.

Filed Mar. 16, 1977, Ser. No. 778,216
Int. Cl.[2] A47F *3/04*; F25B *29/00*
U.S. Cl. 62—256 11 Claims



1. A chest-type ar defrost refrigerated display operable in a refrigeration mode and a defrost mode, comprising:

a storage chest having an open top, a refrigeration coil, and recirculation air flow passage means for recirculating cold air from said open top to said coil and back to and across said open top during the refrigeration mode, said passage means including a refrigerated air outlet opening at one side of said open top and oriented for air flow therefrom in a direction across said open top, and an air return opening at the opposite side of said open top having a biorientation including portions oriented to receive return air flow across said open top from said refrigerated air outlet opening during the refrigeration mode, and other portions oriented to discharge reverse defrost air flow from said passage means into ambient air during the defrost mode; and two-way air propelling means arranged to so recirculate cold air in one direction through said passage means in the refrigeration mode, and to cause defrost air flow from the ambient air, in the reverse direction through said passage means, and out said bioriented opening to the ambient air during the defrost mode, the defrost air flow in said reverse direction through said passage means being greater than refrigeration flow in said one direction.

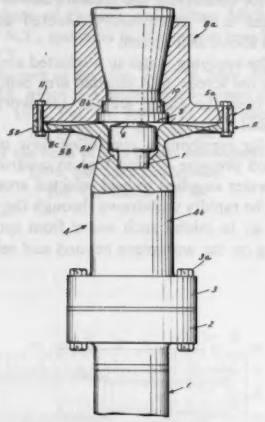
4,120,175
FLEXIBLE SHAFT COUPLING

Robert Dernedde, Frankenthal, Fed. Rep. of Germany, assignor to Klein, Schanzlin & Becker Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 16, 1976, Ser. No. 723,712
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1975, 2542946
Int. Cl.[2] F16D *3/56*
U.S. Cl. 64—15 B 19 Claims

1. A flexible coupling, particularly for transmission of torque to rotary parts of a pump in a nuclear reactor plant, comprising coaxial first and second rotary members having first and second flanges which are adjacent to each other, at least said first flange being elastically deformable; means for fastening said flanges to each other so that rotation of one of said members results in the transmission of torque to the other of said members through the medium of said fastening means; and first and second thrust transmitting elements respectively provided in said first and second rotary members and surrounded by the respective flanges, said elements having abutting faces which

are in substantial point contact with each other in the region of the common axis of said rotary members and bear against each



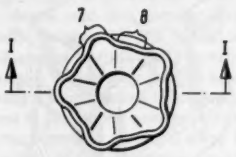
other with a predetermined force acting in the axial direction of said rotary members.

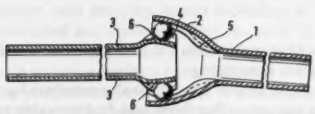
4,120,176

UNIVERSAL JOINT

Alfred Ebbinghaus, P.O. Box 1320, 7080 Aalen, Fed. Rep. of Germany

Filed Jun. 16, 1976, Ser. No. 696,515
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1975, 2527376; Jan. 21, 1976, 2602074; Feb. 3, 1976, 2603991
Int. Cl.[2] F16D 3/30
U.S. Cl. 64—21 7 Claims





1. A universal joint comprising:

an outer bearing race defining member, said outer race defining member having a generally concave internal configuration, said outer race defining member being integral with and at the first end of a tubular drive shaft, the wall thickness of said outer race defining member being the same at all points and being substantially equal to the wall thickness of the tubular drive shaft;

an inner bearing race defining member, said inner race defining member being integral with and at the first end of a tubular driven shaft and having a generally spherical configuration, said inner race defining member being received in said concave end portion of said drive shaft outer bearing race defining member and cooperating therewith to define ball bearing races; and

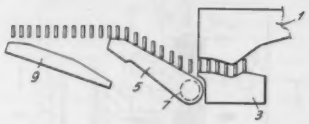
bearings positioned in said races.

4,120,177

RADIALLY INSERTABLE AND PIVOTABLE CAMS

Fabrizio Micheletti, Fucecchio, Florence, Italy, assignor to Brematex S.p.A., Prato, Florence, Italy

Filed Jul. 20, 1977, Ser. No. 817,346
Claims priority, application Italy, Jul. 20, 1976, 9533 A/76
Int. Cl.[2] D04B 9/00
U.S. Cl. 66—40 3 Claims



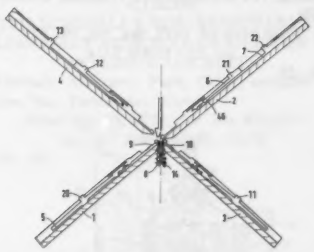
1. In a circular knitting machine, means for selectively positioning needles comprising a needle positioning cam radially movable into and out of the path of needle control butts, a needle raising cam mounted on the machine in advance of said needle positioning cam and being pivoted at its advance end for pivoting from a lower inoperative position out of the path of said control butts to an inclined clearing position in the path of said control butts for raising said control butts to clear said positioning cam, and allow insertion of said positioning cam without interference with said control butts and means for pivoting said raising cam to said clearing position to permit insertion of said positioning cam without interference with the control butts.

4,120,178

KNITTING MACHINE

Gottfried Kuhnert, Aalen, Germany, assignor to Universal Maschinenfabrik Dr. Rudolf Schieber KG, Westhausen, Germany

Continuation-in-part of Ser. No. 665,202, Mar. 9, 1976, abandoned. This application Oct. 4, 1977, Ser. No. 839,472
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1975, 2511086
Int. Cl.[2] D04B 7/06
U.S. Cl. 66—63 3 Claims

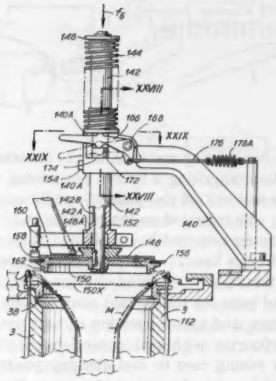


1. A double flat-bed knitting machine comprising four needle beds disposed in two mutually opposed pairs, a plurality of needles associated with each pair of needle beds, slide means carrying cam means for actuating said needles in the needle beds, each pair of needle beds being disposed in one of two mutually bisecting planes respectively, each of said needles having a hook and tongue at each end, associated plate means for moving said needles, and transfer plates disposed at least in the needle beds remote from the location of the knitware take-off.

4,120,179
YARN CUTTING DEVICE FOR A CIRCULAR KNITTING MACHINE

Fabrizio Micheletti, Fucecchio (Firenze), Italy, assignor to Brematex S.p.A., Prato, Italy

Filed Jul. 20, 1977, Ser. No. 817,345
Claims priority, application Italy, Jul. 20, 1976, 9532 A/76
Int. Cl.[2] D04B 15/61
U.S. Cl. 66—145 R 6 Claims

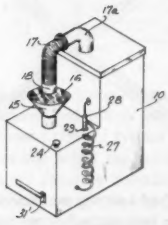


1. In a circular knitting machine of the rotating cylinder type having a ring mounted at its upper end over which the fabric being knit passes into the cylinder, a yarn cutting device comprising a support, a disc having peripheral teeth thereon mounted for free rotation on said support coaxial with said cylinder and movable into frictional engagement with said cylinder for rotation of said disc with said cylinder, an annular resilient friction element seated in said device and facing said cylinder ring for engagement therewith to transmit rotation of the cylinder to rotation of said disc, stationary cutting means mounted on said support and cooperating with said rotating disc to cut yarn, and means for moving said disc into ring engagement for yarn cutting rotation therewith and away from said ring to an inoperative position.

4,120,180
MACHINE FOR CLEANING A FABRIC WORKPIECE

John J. Jedora, 724 Richelieu St., Timmins, Ontario, Canada (P4N 5G6)

Filed May 10, 1977, Ser. No. 795,535
Int. Cl.[2] D06B 5/24
U.S. Cl. 68—20 9 Claims

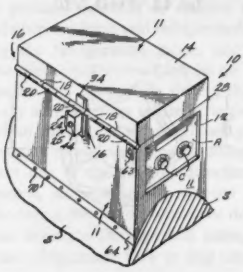


1. A machine for cleaning a fabric workpiece, comprising
(a) a suction nozzle having a screen for supporting the workpiece horizontally;
(b) air blowing means including a motor and a fan;
(c) means for connecting said nozzle to the suction side of said air blowing means for drawing air through said nozzle and past said motor for thereby cooling said motor and heating said air;
(d) means for connecting the pressure side of said air blowing means to a downwardly directed blowing nozzle situtated above said screen;
(e) a tool for applying water to a selected area of the workpiece on the screen, said selected area being substantially smaller than the entire area of the workpiece on the screen; and
(f) means for supplying a controlled flow of water under controlled pressure to said tool to control said flow to enable water supplied to said selected area of the workpiece to be rapidly withdrawn through the suction nozzle by said air to inhibit such water from spreading in and splashing on the workpiece beyond said selected area.

4,120,181
LOCKING MECHANISM

James H. Stubbings, Rockville, Md., assignor to Potomac Applied Mechanics, Inc., Bethesda, Md.

Division of Ser. No. 760,955, Jan. 21, 1977, Pat. No. 4,058,993.
This application May 13, 1977, Ser. No. 796,823
The portion of the term of this patent subsequent to Nov. 22, 1994, has been disclaimed.
Int. Cl.[2] E05B 65/52
U.S. Cl. 70—58 14 Claims



1. A locking mechanism for first and second relative movable members comprising
(a) a first plurality of spaced tubular members having aligned bores and extending from said first movable member,
(b) a second plurality of spaced tubular members having aligned bores and extending from said second movable member, said second plurality of tubular members being spaced apart in a manner to receive said first plurality of spaced tubular member therebetween with bores of said first and second plurality of members aligned,
(c) a removable hardened metal latching bolt having cross-sectional dimensions generally corresponding in shape to the shape of said bores in said first and second plurality of spaced tubular members for receipt thereby to hold said first and second plurality of bores in alignment, and
(d) a locking means for holding said latching bolt in place received by said first and second plurality of tubular members to prevent relative movement between said tubular members, said locking means including a key-release means; and said locking means, including said key-release means, being mounted exterior of said latching bolt.

4,120,182

TAMPER-PROOF LOCKING DEVICE

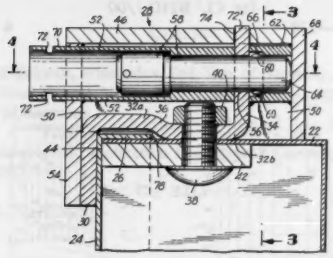
Lionel S. Michelman, Pomona; Samuel M. Michelman; David L. Michelman, both of Queens, and Milton Michelman, Long Beach, all of N.Y., assignors to Michelman Iron Works Corp., Brooklyn, N.Y.

Continuation-in-part of Ser. No. 783,274, Mar. 31, 1977, Pat. No. 4,096,718, which is a continuation-in-part of Ser. No. 693,293, Jun. 7, 1976, Pat. No. 4,031,722. This application Dec. 19, 1977, Ser. No. 861,687

The portion of the term of this patent subsequent to Jun. 28, 1994, has been disclaimed.

Int. Cl.[2] E05B 65/52

U.S. Cl. 70—63 28 Claims



1. A tamper-proof locking device mountable on a lidded container or the like, said device comprising a first member and a second member, said first member having a first portion constructed and arranged to overlie the lid of the container when the lid is closed, said first member having a second portion functionally unitary with and rigidly secured to said first portion, said second portion being constructed and arranged to overlie a side wall of the container below the lid, said first member having a third portion functionally unitary with and rigidly secured to the second portion and extending away from said second portion in a direction away from said side wall of the container, said third portion having an opening therein the axis of which is perpendicular to the plane of the lid, means to firmly secure said second portion to said side wall of the container, said securing means including at least one element constructed and arranged to be operated by a tool in cooperation therewith and located externally of the container, said element in securing position being disposed on the surface of the second portion remote from the container, said second member including a first portion which in cooperation with said first member and when assembled thereon defines with said first member an enclosure that prevents access of a tool to said element, said element in the absence of said second member being accessible to said tool and when said second member is assembled on said first member being inaccessible to said tool, said second member having a second portion which is substantially parallel to the third portion of said first member, said second portion of said second member having an opening therein in alignment with the opening in the third portion of the first member, and a rectilinear shackle receivable in said openings, said shackle having a head constructed and arranged to be disposed above the opening in said second member, said shackle additionally including at a point remote from said head a projection which is extensible from and receivable in said shackle, said projection when the second member is assembled on the first member being arranged to be extended to underlie the third portion of the first member.

4,120,183

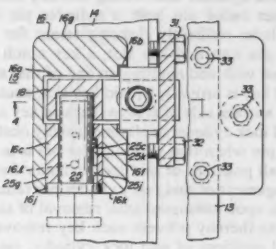
LOCK ASSEMBLY FOR HIGH SECURITY CONTAINER

Russell W. Walters, Richmond, Ky., assignor to BMR Security Products Corp., Richmond, Ky.

Filed Jul. 22, 1976, Ser. No. 707,627

Int. Cl.[2] B65D 55/14

U.S. Cl. 70—159 15 Claims



1. A lock assembly comprising:

(a) means for securing said assembly to a member, and

(b) lock housing means connected to said securing means, said lock housing means having,

(i) a continuous top portion,

(ii) a continuous first side portion adjacent said top portion,

(iii) a second side portion opposite said first side portion,

(iv) a first end portion,

(v) a substantially cylindrical sleeve portion,

(vi) a bar lock extendible in its longitudinal direction within said sleeve portion of said lock-housing means and when said assembly is in the locked condition said bar lock is accessible for unlocking only at said first end portion, said bar lock being capturable within said sleeve portion,

(vii) a second end portion which has a continuous unbroken surface,

(viii) a bottom portion opposite said top portion, said bottom portion being provided with an opening into which strike means may be introduced for engagement by said bar lock and said lock housing means covering and concealing said strike means except through said bottom portion opening.

4,120,184

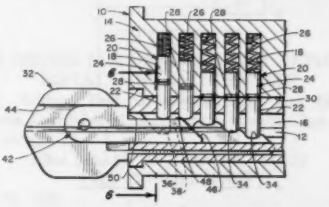
LOCK WITH NORMALLY NON-REMOVABLE KEY AND AUXILIARY KEY REMOVAL DEVICE FOR USE IN INTERIOR LOCKSETS

John R. Gerlach, Monterey Park, Calif., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Sep. 19, 1977, Ser. No. 834,650

Int. Cl.[2] E05B 11/00, 19/00

U.S. Cl. 70—389 14 Claims



1. In a keyed, pin-tumbler lock of the general type having a lock cylinder rotatable in a lock casing, a key slot in the cylinder, a series of spaced-apart radial pin holes partially in each of the lock casing and cylinder and intersecting the key slot,

resiliently inwardly urged sets of casing and cylinder pins with one set in each pin hole, a key in the key slot axially intersecting each of the pin holes with a key notch therein aligned for each set of pins positioning that pin set with a parting line between its casing and cylinder pins at a casing-cylinder parting line permitting cylinder rotation by the key; the improvements in combination therewith comprising: a radial pin hole at least in said lock cylinder intersecting said key slot and spaced from any other radial pin hole; a cylinder pin in that said cylinder pin hole; resiliently reacting means for urging that said cylinder pin into said key slot; a key notch in said key radially aligned with and abutting an end of that said cylinder pin when said key is properly in said key slot; abutment means on said key at an axial side of at least that said key notch axially inward of said lock cylinder at all times axially obstructing that said cylinder pin when that said cylinder pin is in its said key notch and in all positions of said lock cylinder for preventing radial disengagement of that said cylinder pin radially from its said key notch upon attempted axial removal of said key from said key slot to thereby prevent such key removal from said key slot in all positions of said lock cylinder; said resiliently reacting means being constructed and arranged relative to that said cylinder pin to permit free rotation of said lock cylinder at all times at least when that said cylinder pin is received in its said key notch; all key notches in said key including that said key notch having usual surface means at axial sides thereof axially outward of said lock cylinder where necessary for at all times permitting free usual insertion of said key into said key slot in usual manner, all key notches in said key except those having said abutment means having usual surface means at axial sides thereof axially inward of said lock cylinder where necessary for at all times permitting free usual removal of said key from said key slot; a separate key removal member axially insertable into said key slot adjacent said key and having removal surface means thereon for permitting said insertion while moving and retaining at least that said cylinder pin radially from its said key notch and said abutment means obstruction to thereby permit usual axial removal of said key from said key slot.

4,120,185

CONTROL SYSTEM FOR OPERATING STEPS OF A PRESS AND/OR TRANSFER MECHANISM

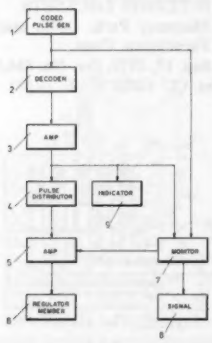
Franz Schneider; Helmut Braitinger, and Burkhard Schumann, all of Göppingen, Fed. Rep. of Germany, assignors to L. Schuler GmbH, Fed. Rep. of Germany

Filed Jan. 22, 1976, Ser. No. 651,531

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1975, 2501637

Int. Cl.[2] B21D *43/02*; B21J *7/46*

U.S. Cl. 72—24 **19 Claims**



1. A control system for controlling operating steps of at least one of a press means and a transfer means therefor comprising coded pulse generating means for providing a coded pulse output in dependence upon the position of a drive shaft of a press drive means, decoding means for decoding the coded pulse output, of the pulse generating means for supplying a decoded pulse output, pulse distributor means for providing an output on at least one of a plurality of output paths in accordance with the decoded output of the decoder means, and at least one regulating means for controlling an operating step being coupled to pulse distributor means for receiving an output therefrom in accordance with the position of the drive shaft of the press means.

4,120,186

MULTI-DIE/BLOCK DRAWING MACHINES

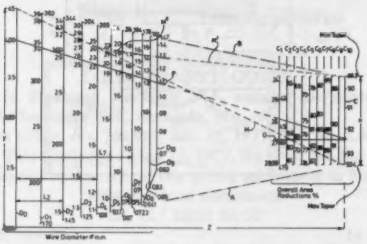
John Warner Pamplin, Bishop Auckland; James Vine Bennett, and Peter Fred Elson, both of Eastleigh, all of England, assignors to Marshall Richards Barcro Limited, Crook, England

Filed Jun. 1, 1977, Ser. No. 802,507

Claims priority, application United Kingdom, Jun. 4, 1976, 23126/76

Int. Cl.[2] B21C *1/00*

U.S. Cl. 72—278 **4 Claims**



1. A method of determining a drawing die drafting sequence for a plurality of at least three successive drawing dies of decreasing cross-sectional areas of a multi-die/block drawing machine comprising choosing the relative cross-sectional areas of the plurality of dies so that the logarithm of the ratio of the product of the initial and final cross-sectional areas of material approaching and leaving each pair of successive dies of the plurality of dies to the square of the cross-sectional area of the material between the successive dies is substantially a constant throughout the sequence.

4,120,187

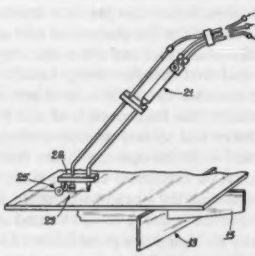
FORMING CURVED SEGMENTS FROM METAL PLATES

Roger F. Mullen, Foxboro, Mass., assignor to General Dynamics Corporation, St. Louis, Mo.

Filed May 24, 1977, Ser. No. 800,037

Int. Cl.[2] B21D *11/00*

U.S. Cl. 72—342 **11 Claims**



1. A method of forming a metal plate to have a three-dimensional shape of predetermined compound curvature, which method comprises

locally heating a metal plate to an elevated temperature along a relatively narrow band by moving a heat source along a predetermined line at a rate such that said heating extends completely through the thickness of said plate,

quickly cooling said plate along said line following said heating so that significant shrinkage occurs within the plane of said plate in a direction substantially perpendicular to said line of heating, and

repeating said heating and cooling steps along additional lines in a preselected geometric pattern arranged throughout all regions of the plate which pattern is derived from the linear distortion which is inherent in the projection of the predetermined compound curvature onto said metal plate whereby the total result of said in-plane shrinkage is that said plate assumes said predetermined compound curvature.

4,120,188

BLIND RIVETER

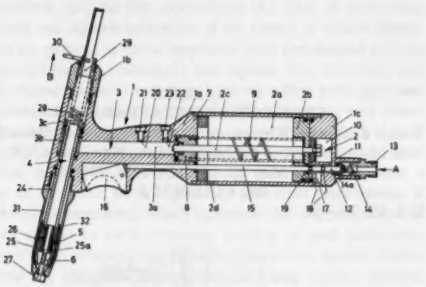
Manfred Schwab, Wiesbaden, Fed. Rep. of Germany, assignor to Fa Alfred Hansel, Nieten-Und Metallwarenfabrik, Ruhr, Fed. Rep. of Germany

Filed Aug. 25, 1976, Ser. No. 717,492

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1975, 2537794

Int. Cl.[2] B21J *15/34*

U.S. Cl. 72—391 **3 Claims**



1. In a blind riveter comprising

chuck jaws for clamping a tension shaft of a blind rivet,

a longitudinally movable tension chuck for moving the chuck jaws radially relative to the tension shaft for clamping and releasing the tension shaft as the tension chuck longitudinally moves in relationship to the chuck jaws back and forth from a charging position into a tension position, the charging position being for insertion of the tension shaft of a blind rivet into the chuck jaws and the tension position being for applying tension to the tension shaft of the blind rivet, wherein as the tension shaft longitudinally moves, the chuck jaws and a clamped tension shaft are carried along until reaching a tear off position of the tension shaft,

a stop face being pressed against the chuck jaws by a loaded spring for pressing the chuck jaws into the charging position,

a loaded return spring for pressing the tension chuck into the charging position, and

means for moving the tension chuck against the force of the return spring,

the improvement comprising an adjustable abutment for the return spring, wherein the position of the abutment is adjustable to vary the load of the return spring for shifting the charging position of the tension chuck.

4,120,189

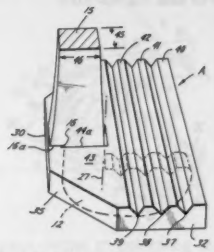
PULLING HOOK APPARATUS

Garland Jones, Jr., Rt. 1, Box 841, Conroe, Tex. 77301

Filed Jul. 5, 1977, Ser. No. 812,579

Int. Cl.[2] B21D *1/12*

U.S. Cl. 72—457 **7 Claims**



1. An all-purpose pulling hook apparatus for straightening or and bending automobile parts with a pulling device, comprising:

a hook member comprising a longitudinally extending handle portion having an eye portion at one end thereof for attaching to the pulling device and having a hook pulling portion at the other end thereof for engaging the automobile parts;

said hook member having a connection point wherein said hook pulling portion connects with said handle portion of said hook member;

said eye portion having a pulling contact point adjacent said end of said hook member;

said hook pulling portion including a hook pulling member having a work engaging surface extending at about a right angle from said handle portion;

a pulling plate member having a work engaging surface of greater size than said work engaging surface of said hook pulling member, said pulling plate member having an opposed plate member back surface;

said pulling plate member having an opening therein for receiving and removably retaining said handle portion with said work engaging surface of said hook pulling portion contacting said opposed plate member back surface of said pulling plate member;

said eye portion and said hook pulling portion are positioned so that a straight pull on said hook member by the pulling device results in a force line that substantially intersects with said connection point and said pulling contact point to facilitate firm engagement with the automobile parts to be straightened or bent; and,

wherein the plane of said work engaging surface of said hook pulling member is oriented at a slight acute angle to a perpendicular to said force line in the direction of said eye portion to prevent slippage of said pulling plate member from the automobile parts to be straightened or bent under a pulling load.

4,120,190

CRAFT DEVICE FOR DECORATIVELY DEFORMING METAL CANS AND THE LIKE

Floyd E. Schlau, East Greenwich, R.I., and Howard J. Morrison, Deerfield, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 14, 1977, Ser. No. 767,432

Int. Cl.[2] B21J *13/08*

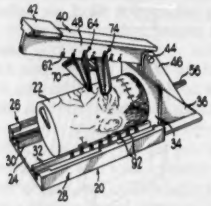
U.S. Cl. 72—458 **12 Claims**

1. Apparatus for decoratively deforming cylindrical metal cans comprising:

a base for supporting a can laid on its side,

a pair of can deforming elements selectively engageable with an upwardly facing surface portion of said can laid in

position on said base, one of said deforming elements including an edge for engaging a can at a highest area on said upwardly facing surface portion, and the other of said deforming elements including a pair of edges angularly disposed to one another for engaging said upwardly facing surface portion of said can at spaced apart lower areas on opposite sides of said highest area.



lever means extending longitudinally of said can and pivotally mounted on said base adjacent one end thereof for manual pivotal movement toward and away from said upwardly facing portion of said can,

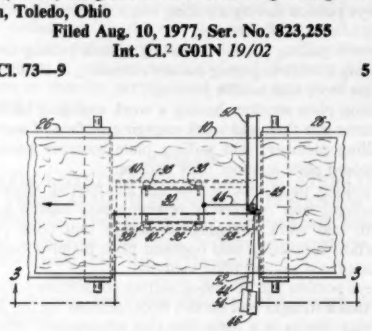
and means for detachably supporting said can deforming elements for controlled deforming engagement against said can surface at selected one of a plurality of longitudinally spaced apart locations on said lever means.

4,120,191

QUALITY CONTROL FOR FIBROUS MATS

James Alan Fly, Conroe, Tex., and Robert O. Slonaker, Pataskala, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 10, 1977, Ser. No. 823,255
Int. Cl.[2] G01N *19/02*
U.S. Cl. 73—9 **5 Claims**



1. Apparatus for measuring the looseness of a fibrous mat comprising:

(a) an abrasive surface;

(b) means for urging said abrasive surface into contact with said mat with a predetermined force;

(c) means for moving said abrasive surface with respect to said mat; and

(d) a strain gauge for measuring the frictional force between said abrasive surface and said mat.

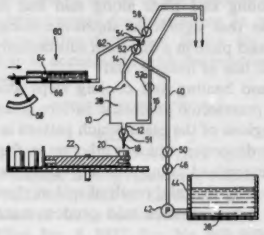
4,120,192

GAS SAMPLING APPARATUS

Lionel Herbert Williamson, 2292 Weston Rd., Apt. 806, Weston, Ontario, M9N 1Z2, Canada

Filed Jun. 17, 1977, Ser. No. 807,475
Int. Cl.[2] G01N *7/04*
U.S. Cl. 73—19 **8 Claims**

1. A method of determining the quantity of air present in a liquid containing dissolved CO_2 comprising the steps of: introducing a predetermined quantity of said liquid to a sampling system, preferentially absorbing free CO_2 gas evolved from said predetermined quantity of liquid in a liquid CO_2— absorbent solution contained in said system whereby any air present in said gas is concentrated as a residual gas in said liquid CO_2— absorbent solution, subjecting said liquid CO_2— absorbent solution and residual gas in a confined volume to a



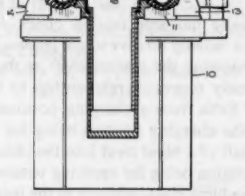
predetermined compressive force and measuring the amount of any resulting volumetric change whereby the volume of air present can be determined.

4,120,193

LEAK-DETECTING APPARATUS

Walter J. Tomsic, Warren, and Floyd E. Hamilton, Detroit, both of Mich., assignors to Uniroyal, Inc., New York, N.Y.

Filed May 12, 1977, Ser. No. 796,285
Int. Cl.[2] G01M *3/16*
U.S. Cl. 73—40 **4 Claims**

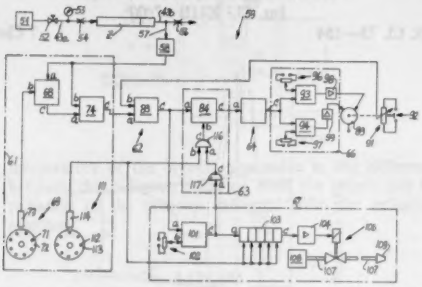


1. In a fluid-operated tire-vulcanizing press having an operating cycle wherein a fluid-inflatable diaphragm which forms an expansible chamber is utilized in conjunction with heated molds to shape and cure a pneumatic tire positioned between the inflatable diaphragm and the molds, leak-detecting apparatus comprising leakage fluid-transfer means communicating with said chamber when a leak occurs in said chamber, and sensing means in said fluid-transfer means and responsive to leakage fluid from said expansible chamber and actuated by said leakage fluid for indicating a malfunction of the press, said fluid-transfer means including means for preventing air from outside the press from entering the fluid-transfer means in the vicinity of said sensing means.

4,120,194
METHOD AND APPARATUS FOR TESTING THE WRAPPERS OF CIGARETTES, FILTER ROD SEGMENTS, AND ANALOGOUS ROD-SHAPED ARTICLES

Joachim Reuland, Hamburg, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. K.G., Fed. Rep. of Germany

Filed Sep. 8, 1975, Ser. No. 611,407
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1974, 2444708; Nov. 26, 1974, 2455768
Int. Cl.[2] G01M *3/32*
U.S. Cl. 73—45.2 **39 Claims**



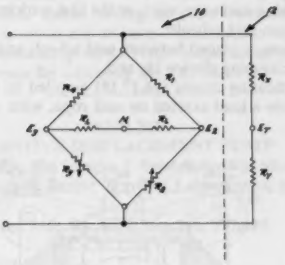
1. A method of testing the wrappers of cigarettes, cigars, filter rods, analogous rod-shaped smokers' products, components thereof, and the like, comprising the steps of generating pneumatic test signals indicative of the extent to which imperfections are present in the wrappers of such rod-shaped articles and converting the pneumatic test signals into electrical test signals; conveying said test signals along a first path; generating a pneumatic comparison signal and converting said pneumatic comparison signal into an electrical comparison signal; conveying said comparison signals along a second path, at least a portion of one of said paths being common to at least a portion of the other of said paths so that drift phenomena, if any, and not ascertained, which influence the characteristics of said test signals in each common portion of said paths also influence the characteristics of said comparison signals; deriving from the electrical comparison and test signals derived signals dependent upon the difference between the electrical comparison and test signals but uninfluenced by drift phenomena; and determining whether the wrappers are defective or non-defective by comparing the derived signals against a reference value.

4,120,195
METHOD OF USING EMBEDDED NORMAL STRESS SENSORS IN PROPELLANT GRAINS

Harold Leeming, Redlands, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 11, 1977, Ser. No. 823,556
Int. Cl.[2] G01L *1/22*
U.S. Cl. 73—768 **1 Claim**

1. In an improved process for utilizing embedded stress sensors having a modified bridge circuit containing temperature sensitive active resistive elements and first and second serially connected resistors coupled in parallel with said bridge, comprising the steps of connecting the output of the bridge circuit to a diaphragm gage; measuring the voltage of the bridge circuit; detecting a voltage output between one point on the bridge circuit and a point between the serially connected first and second resistors; and monitoring changes in

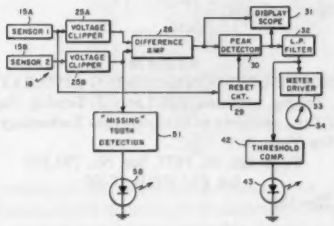


the diaphragm gage output to determine changes in temperature and stress conditions.

4,120,196
PRODUCTION TOOL WEAR DETECTOR

Dean Elwyn Hamilton, Lancaster, Mass.; Marcel Pierre Joseph Gaudreau, La Pocatiere, Canada, and Alan Leo Wu, Cambridge, Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Mar. 25, 1977, Ser. No. 781,145
Int. Cl.[2] G01N *3/58*
U.S. Cl. 73—104 **23 Claims**



1. A system for detecting the wear characteristics of at least one cutting tool having at least one cutting surface and at least one non-wearing reference surface, said system comprising

at least one sensing means for providing information concerning the distance from said sensing means to said at least one cutting surface and for providing information concerning the distance from said sensing means to said at least one non-wearing reference surface;

means for processing the information concerning said at least one cutting surface distance and the information concerning said at least one reference surface distance, said processing means providing a determination of the wear characteristics of said at least one cutting tool.

4,120,197
DEVICE FOR SENSING EXERTED LOAD ON A ROPE, WIRE, OR THE LIKE

Kurt E. Johansson, Kiruna, Sweden, assignor to Ingenjorsfirman R. Ohrnell AB, Karlstad, Sweden

Filed Dec. 9, 1977, Ser. No. 859,101
Claims priority, application Sweden, Dec. 16, 1976, 7614175
Int. Cl.[2] G01L *5/10*
U.S. Cl. 73—144 **12 Claims**

1. A device for sensing exerted load on a rope, wire, or the like, comprising:

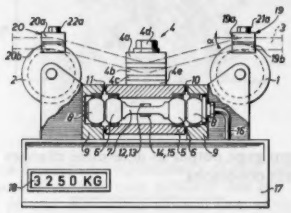
two mutually aligned wheels (1, 2) having respective rope or wire retaining means around at least a portion of their

peripheral surfaces, said rope, wire, or the like passing over at least a portion of each of said wheels and in engagement with said retaining means;

a clamping device (4) mounted between said wheels for clamping said rope, wire, or the like, with its path diverted between said wheels;

a load sensor placed between said wheels and connected to said clamping device (4) and;

load indicating means (16,17,18) coupled to said sensor to indicate a load exerted on said rope, wire, or the like;



said load sensor including a shaft (7), a roller (5), self-aligning means (6) pivotably mounting said roller (5) on said shaft (7) at spaced apart positions on said shaft, said roller (5) being mechanically connected to said clamping device (4), and a plurality of transducers (12–15) mounted to said shaft (7), said transducers (12–15) being arranged to produce an electrical quantity which is a function of the bending of said shaft (7) and being coupled to said load indicating means which indicates load as a function of said electrical quantity.

4,120,198

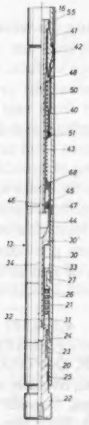
WEIGHT-ON-BIT MEASURING APPARATUS

Denis R. Tanguy, Houston, and Larry J. Leising, Sugar Land, both of Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Apr. 26, 1977, Ser. No. 791,101

Int. Cl.[2] E21B *47/00*

U.S. Cl. 73—151 **11 Claims**



1. A weight-on-bit measuring apparatus comprising: tubular housing members adapted to be connected in a drill string and arranged for limited longitudinal relative movement; means for connecting one of said members to a drill bit; means yieldably resisting longitudinal relative movement of said members in a manner such that the extent of said relative movement is a function of the axial loading of said members; and means for measuring the longitudinal relative movement of said members including a sensor on the other of said members, linkage means coupled between said one member and said sensor, and means providing an elastic discontinuity in said linkage means for substantially isolating said sensor from vibration of said one member due to the cutting action of a drill bit.

4,120,199

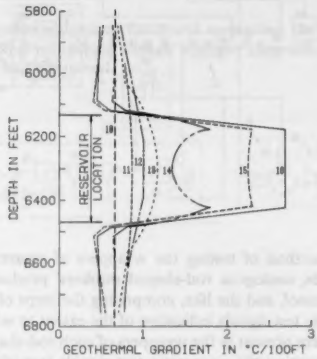
HYDROCARBON REMOTE SENSING BY THERMAL GRADIENT MEASUREMENT

Irshad R. Mufti, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Mar. 10, 1977, Ser. No. 776,345

Int. Cl.[2] E21B *47/00*

U.S. Cl. 73—154 **7 Claims**



1. A method of exploring for hydrocarbon deposits from a borehole in the earth which does not penetrate a hydrocarbon deposit, comprising;

measuring temperature gradient at a plurality of depths along at least a portion of a borehole which does not penetrate a hydrocarbon deposit,

plotting the measured values of temperature gradient versus depth, and

inspecting the plot of temperature gradient versus depth to infer proximity of a region having unusually low thermal conductivity and limited lateral extent.

4,120,200

METHOD AND DEVICE FOR PYROMETRIC TEMPERATURE MEASUREMENTS

Klaus Joachim Braun, Uberlingen, Fed. Rep. of Germany, assignor to Bodenseewerk Perkin-Elmer & Co., GmbH, Uberlingen, Fed. Rep. of Germany

Filed Jun. 13, 1977, Ser. No. 805,752

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1976, 2627254

Int. Cl.[2] G01J *5/52, 5/62*

U.S. Cl. 73—355 R **9 Claims**

1. A device for pyrometrically measuring temperature of an object within range of between about 100° C and about 2700° C comprising:

a radiation detector, sensitive at least in a limited wavelength range of from about 8 to about 14 microns,

a filter which is only transparent in said limited wavelength range,

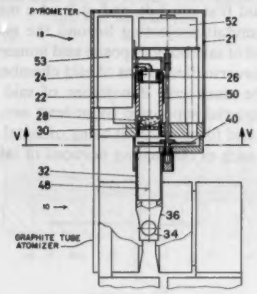
a reflecting member for imaging the radiation detector onto itself,

temperature control means for automatically maintaining the temperature of the radiation detector at a substantially constant value,

means for alternately directing radiation from said object and the radiation of the detector reflected from the re-

flecting member to the radiation detector through the filter, and

signal processing means for receiving signals from said radiation detector and outputting a signal indicative of the



temperature of the object, responsive to the difference between the radiation detected from the object and the radiation of the detector reflected from the reflecting member

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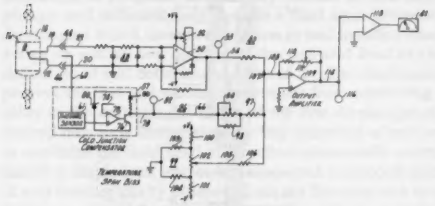
4,120,201

THERMOCOUPLE TEMPERATURE MEASUREMENT CIRCUIT HAVING COLD JUNCTION COMPENSATION

Thomas J. Wargo, Waukegan, Ill., assignor to Partlow Corporation, New Hartford, N.Y.

Filed Mar. 18, 1977, Ser. No. 779,182
Int. Cl.[2] G01K 7/12
U.S. Cl. 73—361 **9 Claims**



1. A circuit for providing cold junction temperature compensation to a thermocouple having a hot junction applied to a body for temperature measuring purposes, said circuit providing an output signal for driving a signal responsive temperature indicating meter, said circuit comprising:

input terminals connectable to said thermocouple for forming the cold junction for which temperature compensation must be provided and for receiving an input signal from the thermocouple;

an input amplifier coupled to said input terminals for amplifying the thermocouple input signal;

cold junction temperature compensation means including integrated circuit means having a temperature sensor means located in proximity to the cold junction for sensing the temperature of the cold junction and amplifier means providing a signal, the magnitude of which varies in accordance with the temperature of the cold junction, said cold junction temperature compensation means further including means for applying a predetermined cold junction temperature compensation coefficient to the signal of said integrated cicuit means to provide an output signal having a predetermined relationship between signal magnitude and cold junction temperature;

summing junction means for receiving the output signals from said input amplifier and cold junction temperature compensation means for providing a temperature indicating signal which is compensated for cold junction temperature;

bias means coupled to said summing junction for providing a bias signal; and

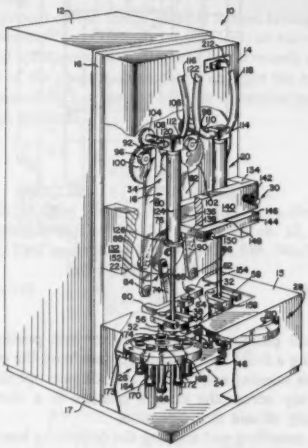
output amplifier means having an input connected to said summing junction and an output connectable to said temperature indicating meter, said output amplifier means having means for adjusting the gain thereof.

4,120,202

POSITIVE DISPLACEMENT PUMP

Richard J. Range, and Charles I. Soodak, both of Silver Spring, Md., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 15, 1977, Ser. No. 777,597
Int. Cl.[2] G01N 1/14
U.S. Cl. 73—421 R **14 Claims**



12. A positive displacement pump apparatus for aspirating and discharging liquid materials to be analyzed, said apparatus including at least one syringe assembly having a movable plunger unit, a reciprocable carriage, said carriage having means associated therewith for engaging a portion of said plunger, means for reciprocating said carriage under power, a syringe valve movable between at least first and second positions permitting, respectively, communication between said syringe interior and an intake line and between said syringe interior and a discharge line, means for moving said valve between said positions, means for controllably varying the effective length of the syringe stroke, said means including an assembly for selectively inserting separate stroke-length determining means between a portion of said carriage and a portion of said syringe plunger, and an operative drive connection between said means for reciprocating said carriage and said means for moving said valve between said first and second positions.

4,120,203

CROSSCUT SAMPLER FOR PNEUMATIC CONVEYING SYSTEMS

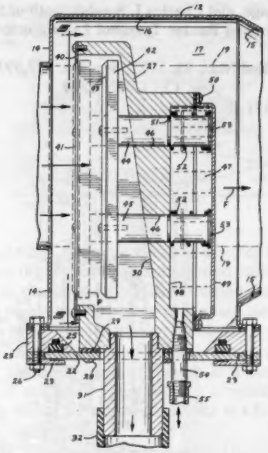
George William Clements, Minneapolis, and Hugo Wenshau, Burnsville, both of Minn., assignors to Gustafson, Inc., Hopkins, Minn.

Filed Apr. 14, 1977, Ser. No. 787,369
Int. Cl.[2] G01N 1/20
U.S. Cl. 73—422 R **6 Claims**

1. Apparatus for drawing a representative sample of flowing material from the conveying pipe of a pneumatic conveying system, comprising

a sealed housing with aligned entrance and exit ports for connection into the conveying pipe, the housing having an open interior with an unobstructed central flow passage aligned with the ports to permit free flow of the material laden air moving through the pipe, the housing also having open side portions adjacent the central passage,

means collecting and storing samples of the material flowing through the central passage of the housing and including a sample collecting head in the housing and movable therein from one side portion and in a first direction transversely of the central passage and entirely through said



central passage and into another side portion, the head having a front face oriented to confront the entrance port of the housing and having an elongate opening to extend entirely across the central passage in a direction transversely of said first direction,

means mounting and moving the collecting head in said first direction, and

a closure in the housing and releasably engaging the head at the opening to tightly close and seal the opening, and the closure being on the head and movable into and out of obstructing relation with the opening.

4,120,204

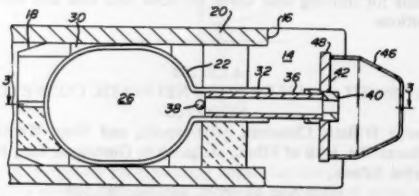
DEVICE FOR COLLECTING SAMPLES OF MOLTEN METALS

Omer P. Cure, Diepenbeek, Belgium, assignor to Electro-Nite Co., Philadelphia, Pa.

Continuation-in-part of Ser. No. 723,360, Sep. 15, 1976, Pat. No. 4,037,478. This application Jul. 27, 1977, Ser. No. 819,308

Int. Cl.[2] G01N *1/12*

U.S. Cl. 73—425.4 R **9 Claims**



1. A device for collecting a sample of molten metal comprising a non-metallic refractory body having a chamber therein, a vessel in said chamber and comprised of mating portions which are readily separable, a filling conduit supported by said body and having one end communicating with one end of said vessel, the other end of said conduit terminating adjacent an end face at the immersion end of said body, a second conduit made from a frangible material, one end of said second conduit communicating with said vessel at the opposite end of the vessel from said first conduit, and at least a major portion of said second conduit projecting beyond the end face of said body at the end of said body opposite said immersion end of the body, and transverse dimensions of said chamber being at least as large as the transverse dimensions of said conduits, and deoxidizing material supported by at least one of said vessel and conduits, said filling conduit being of metal and releasably connected to each of the mating portions of said vessel.

4,120,205

DEVICE FOR THE REPEATED REPRODUCIBLE DELIVERY OF DEFINITE VARIABLE AMOUNTS BY VOLUME

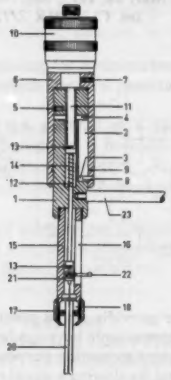
Johannes Ripphahn, and Ernst Kriegbaum, both of Darmstadt, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Fed. Rep. of Germany

Filed Jul. 19, 1977, Ser. No. 816,977

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1976, 2632970

Int. Cl.[2] B67D *1/10*; G01N *1/14*

U.S. Cl. 73—425.6 **11 Claims**



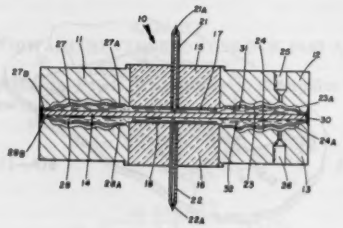
1. Apparatus adapted for variable predeterminable settings to effect the repeated, reproducible delivery of definite volumetric amounts of liquid, and with permissive interim cleaning of the apparatus without altering the predetermined delivery setting thereof; and comprising a syringe cylinder and piston assembly having a piston with actuating means for the piston; a micrometer screw assembly; mounting means connecting the said assemblies for relative movement therebetween, and stop means adjustably located by said micrometer screw assembly to a pre-selected position for limiting the intake stroke of the syringe piston in accordance with the predetermined setting of the micrometer screw assembly as determined by the preselected volume to be delivered from the syringe cylinder on the exhaust stroke of the syringe piston, and another position upon relative movement of said assemblies with the stop means shiftable to permit full intake and exhaust strokes of the syringe piston, as for interim cleaning or rinsing of the syringe cylinder, without altering the predetermined setting of the stop means by the micrometer screw assembly upon return to the pre-selected position of the assemblies.

4,120,206

DIFFERENTIAL PRESSURE SENSOR CAPSULE WITH LOW ACCELERATION SENSITIVITY

Stanley E. Rud, Jr., Eden Prairie, Minn., assignor to Rosemount Inc., Minneapolis, Minn.

Filed Jan. 17, 1977, Ser. No. 759,837
Int. Cl.[2] G01L *9/12*
U.S. Cl. 73—718 **15 Claims**



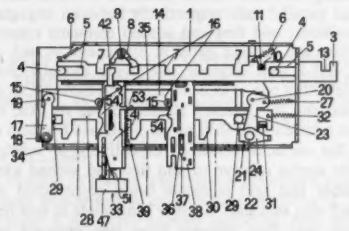
1. A pressure sensor for operation in environments requiring a desired design minimum temperature, comprising a housing, means defining a cavity in said housing at one end thereof, a first diaphragm fixed to said housing and enclosing said cavity, said first diaphragm having portions which deflect relative to the housing under pressure, a second flexible diaphragm sealingly fixed to said housing within said cavity and separating the first diaphragm from first portions of said cavity and defining an isolation chamber with respect to said first portions of said cavity, means to supply a pressure to be measured to said isolation chamber, said second diaphragm having a surface facing the first diaphragm, an incompressible fluid layer between substantially the entire surface of said second diaphragm facing said first diaphragm, said fluid layer being of minimal dimension in direction substantially normal to said first diaphragm and sufficient only to form a fluid layer between said diaphragms which transfers pressures in said isolation chamber acting on said second diaphragm through said fluid to change deflection of said deflecting portion of the first diaphragm and prevent the first and second diaphragms from contacting each other in the deflecting portions of the first diaphragm at said desired minimum temperature during operation of said sensor to minimize the fluid head in direction substantially normal to said first diaphragm, and means supported on second portions of said housing cavity different from the first portions to sense deflection of said first diaphragm from a reference position.

4,120,207

KEYBOARD FOR THE PRESELECTION OF ELECTROMAGNETIC SIGNALS

Ezio F. Dellantonio, Rome, Italy, assignor to Autovox S.p.A., Rome, Italy

Filed Oct. 12, 1976, Ser. No. 731,331
Int. Cl.[2] F16H *35/18*; H03J *5/08*
U.S. Cl. 74—10.33 **10 Claims**



1. In a keyboard for the preselection of electromagnetic signals, wherein a frame carries a tuning system operated by a manual knob operated tuning mechanism provided with a disengageable clutch means and by a number of pushbutton keys each having stored thereon a position to be imparted to the tuning system, the improvement comprising: a tuning slider longitudinally reciprocal with respect to the frame, wherein said tuning slider is declutchably coupled to said manual knob mechanism and coacts with the tuning system by selecting different predetermined signals corresponding to each longitudinal position of said tuning slider; a number of levers pivoted on the frame, each lever having one end coacting with the tuning slider; and adjustable means engaging the other end of each of said levers and provided on each of said keys, the keys being guided on the frame at right angles to the tuning slider, said keys being also reciprocal between an extracted rest position and a retracted operative position, in which operative position the adjustable means imparts a selected rotation to the corresponding lever and thereby implements a selected longitudinal movement to said tuning slider, the improvement further comprising:

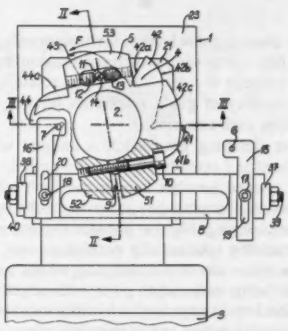
a link reciprocal on the frame parallel to said tuning slider; a number of elements projecting from said link; an eared cam on each key; and spring means urging said link towards a position wherein one of the projecting elements engages the eared cam of the corresponding key pushed into the operative position, to lock it in that position.

4,120,208

CONTROL STEPPING DEVICE

Robert Habib, 36 Quai Gustave Ador, 1207 Geneva, Switzerland

Continuation-in-part of Ser. No. 586,620, Jun. 13, 1975, abandoned. This application Nov. 8, 1976, Ser. No. 740,070
Int. Cl.[2] F16H *27/02*
U.S. Cl. 74—128 **11 Claims**



1. Stepping device, comprising;

a support having means defining a stepping area;

a single plate of circular outline, the plate having a number of teeth distributed over a circumferential area thereon with a gap between every two teeth, each tooth having a side oblique to a diameter of the plate;

means for mounting the plate in the stepping area, interchangeably with generally similar plates having different numbers of teeth, for rotation about the center of the circular outline; and

an elongate arm mounted for longitudinal forward and backward movements in the stepping area, parallel to a diameter of the plate, and having means for effecting such movements, the arm having finger means thereon for forwardly and backwardly moving therewith along a path generally diametrical of the plate and disposed relative to the teeth to effect intersecting of oblique sides of successive ones of the teeth with said path for (a) thereby engaging successive ones of the oblique sides to effect successive steps of the rotation of the plate and (b) temporarily locking the plate against the rotation thereof, at the end of each move-

ment of the arm, by then locating the finger means in a base portion of a gap between the tooth the oblique side of which was engaged during the movement and a next following one of the teeth.

4,120,209

CLAMPING MECHANISM FOR TEMPORARILY CLAMPING CABLES AND THE LIKE

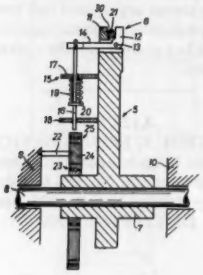
Kurt Vogt, Beinwil am See, Switzerland

Continuation of Ser. No. 288,175, Sep. 11, 1972, abandoned. This application May 8, 1975, Ser. No. 575,557

Claims priority, application Switzerland, Mar. 8, 1972, 3395/72

Int. Cl.[2] **F16H** *55/36;* **B21F** *17/00;* **B65H** *59/16, 81/00*

U.S. Cl. 74—230.24 **2 Claims**



1. A clamping mechanism for temporarily clamping a cable or the like, comprising a carriage, a clamping wheel mounted at said carriage to rotate about a first rotational axis and carrying a plurality of guide assemblies for the cable, said guide assemblies each comprising:

a first clamping jaw which is integral with the clamping wheel and extends substantially radially thereof;

an L-shaped member having one limb which constitutes a second clamping jaw extending substantially radially of the clamping wheel at one side thereof, and the other limb extending substantially parallel to said rotational axis to the other side of the clamping wheel, the L-shaped member being mounted to pivot with respect to the clamping wheel about an axis which is located at said one side of the clamping wheel and is perpendicular

both to said first rotational axis and to the radius from said first rotational axis to the second clamping jaw;

a control rod which is located at said other side of said clamping wheel and acts on the free end of said other limb; and

spring means which act on the control rod to urge said second clamping jaw towards the first clamping jaw in order to clamp fixedly a section of cable located therebetween,

and the clamping mechanism further comprising a stationary control element which acts on the control rods in opposition to said spring means to eliminate the clamping action of the cooperating pairs of clamping jaws for receiving and releasing respectively the cable at predetermined portions of the revolving path of travel of the clamping wheel, said stationary control element having a circular periphery which is centered on a second rotational axis offset from but parallel to the first rotational axis, and the mechanism also comprising a circular bearing member which is supported at said circular periphery to rotate about said second rotational axis and is constrained to rotate at the same angular velocity as the clamping wheel.

4,120,210

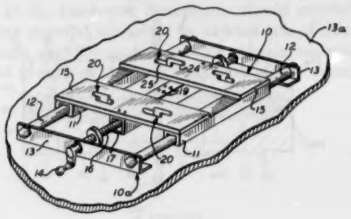
MOUNT FOR MOTOR HAVING VARIABLE PITCH PULLEY

Jerome J. Sloyan, Trenton, N.J., assignor to Automatic Motor Base Co., Windsor, N.J.

Filed Jul. 15, 1976, Ser. No. 705,456

Int. Cl.[2] **F16M** *11/04, 7/00*

U.S. Cl. 74—242.13 R **9 Claims**



1. A motor mount comprising a longitudinally movable carriage having an upper surface on which a motor is mounted, said surface having stud-receiving portal openings that are elongated in a direction transverse to the longitudinal direction of movement of said carriage, each of said portal openings being composed of a pair of slots each having toe and heel ends with the toe ends projecting in a direction longitudinally away from each other and with the heel ends lapping one with respect to the other, said portal openings being operatively receptive of motor clamping studs therethrough at selected locations ranging from toe to toe of the slots and said portal openings being arranged in a substantial rectangular pattern on the upper surface so that a portal opening is located at each corner of an imaginary right angle rectangle on said upper surface.

4,120,211

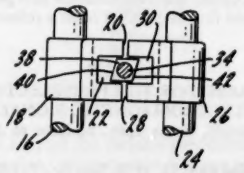
TRANSMISSION SHIFT CONTROL MECHANISM

Dan Joseph Showalter, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed May 6, 1977, Ser. No. 794,494

Int. Cl.[2] **G05G** *9/14*

U.S. Cl. 74—473 R **4 Claims**



1. In a shift control mechanism for a multi-speed transmission including first and second elements movable along first and second parallel axes respectively between engaging and neutral positions, said first and second elements respectively defining first and second gates in alignment in said neutral positions, and a shift member selectively movable into said gates for selecting one of said elements and movable along said axes for moving the selected element along its axis; the improvement wherein said shift member defines first and second opposed flat surfaces oriented respectively at substantially equal acute angles relative to said first and second axes, said shift member and said elements being constructed and arranged such that said shift member is movable in said first gate for moving said first element from one engaged position through its neutral position to another engaged position with said shift member spaced from said second element, said shift member also being movable in said first gate for moving said

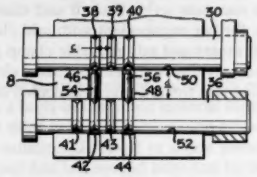
first element from one engaged position toward its neutral position with said second surface sliding along said second element, being guided by said second surface for movement at one of said acute angles out of said first gate and into said second gate as said first element is moved to its neutral position, and being movable in said second gate for moving said second element from its neutral position to one of its engaging positions with said shift member spaced from said first element.

4,120,212

FORWARD-REVERSE INTERLOCK FOR A TRANSMISSION

R. Dale Philipsen, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 25, 1977, Ser. No. 844,551
Int. Cl.[2] G05G *5/10*
U.S. Cl. 74—476 **4 Claims**



1. A shift interlock for a transmission gear shift control system having a pair of shift forks, the shift interlock comprising:

a housing defining a pair of substantially parallel bores separated by a first predetermined distance;

a first rod operably connected to one of said shift forks, said first rod reciprocably disposed in one of said parallel bores and defining thereabout three circumferential annular grooves each spaced on from the next a second predetermined distance center-to-center;

a second rod operably connected to the other of said shift forks and reciprocably disposed in the other of said parallel bores, the second rod defining thereabout four circumferential annular grooves each spaced one from the next the same second predetermined distance center-to-center;

said housing further defining a pair of lock pin bores normal to and interconnecting said parallel bores, said lock pin bores having a center-to-center spacing equal to twice said second predetermined distance;

and a pair of lock pins each disposed in one of said lock pin bores and having a length greater than said first predetermined distance;

said first rod movable from a neutral position in a first direction or a second direction to urge at least one of said lock pins into one of the four annular grooves of said second rod to prevent reciprocation of said second rod, said second rod reciprocable from a neutral position in the same first and second directions only with said first rod in the neutral position.

4,120,213

SELF-BALANCING CONTINUOUS POWER TRANSMISSION SYSTEM AND METHOD

Abraham Levy, 44 Alumim St., Afeka, Tel Aviv, Israel

Filed Oct. 6, 1975, Ser. No. 619,878
Int. Cl.[2] F16H *47/08*
U.S. Cl. 74—688 **66 Claims**

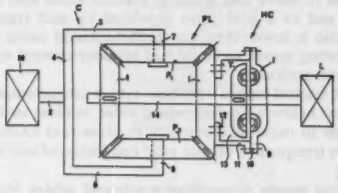
1. A method of torque transmission between a prime mover and a load, comprising in combination the steps of:

providing a planetary system including first, second and third members;

providing a hydraulic torque coupling having an input and an output;

interconnecting said planetary system and said hydraulic torque coupling in a feedback loop by rigidly connecting said first member to said input and rigidly connecting said output with said second member;

coupling said prime mover to said third member of the planetary system; and



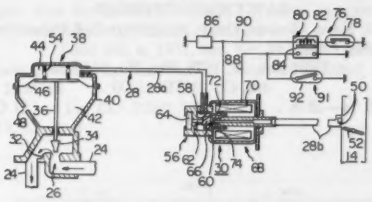
transferring the output torque of the planetary system and the hydraulic torque coupling from said second member and said output to the load.

4,120,214

EXHAUST GAS RECIRCULATION SYSTEM

Yoshio Toda, Yokohama, and Yoshio Iwasa, Nagareyama, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Aug. 30, 1976, Ser. No. 718,967
Claims priority, application Japan, Dec. 22, 1975, 50-153172
Int. Cl.[2] F02M *25/06*; F02B *33/00*
U.S. Cl. 74—860 **6 Claims**



1. An exhaust gas recirculation system for an internal combustion engine for a motor vehicle, comprising an exhaust gas recirculation (EGR) passageway for feeding exhaust gas of said engine into an intake passageway thereof, an exhaust gas recirculation (EGR) control valve disposed in said EGR passageway to meter in accordance with an operating condition of said engine the amount of said engine exhaust gas passing through said EGR passageway, an actuator for operating said EGR control valve to control the degree of opening of said EGR control valve to vary the effective cross sectional area of said EGR passageway in accordance with the vacuum prevailing in said intake passageway, and means for causing said actuator to close said EGR control valve when a transmission of said vehicle provides a gear ratio lower than a predetermined value, said actuator includes a vacuum chamber fed with the vacuum in said intake passageway adjacent to a throttle valve rotatably mounted therein, a flexible diaphragm operatively connected to said EGR control valve to operate it in response to the vacuum in said vacuum chamber, and passage means for feeding into said vacuum chamber said vacuum in said intake passageway, and the first-mentioned means comprises an actuator control valve disposed in said passage means and having a port communicating with the atmosphere, said actuator control valve having and being movable between a first position for closing said port and for allowing the supply of said intake passageway vacuum into said vacuum chamber and a second position for stopping the supply of said intake passageway vacuum into said vacuum chamber and for providing communication between said vacuum chamber and said

port to admit atmospheric air into said vacuum chamber to cause said diaphragm to close said EGR control valve, operating means for alternatively moving said actuator control valve into said first and second positions, and first control means responsive to a gear ratio provided by said transmission which ratio is higher than a predetermined value to cause said operating means to move said actuator control valve into said first position and to a gear ratio provided by said transmission which ratio is lower than said predetermined value to cause said operating means to move said actuator control valve into said second position.

second control means responsive to a temperature of said engine below a predetermined value to close said passage means to cause said actuator to close said EGR control valve irrespective of gear ratio conditions of said transmission,

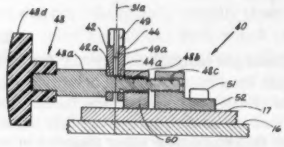
operating means comprising a solenoid which has a core operatively connected to said actuator control valve and causes said actuator control valve to move into said first position when deenergized and to move into said second position when energized, and said first control means comprises first switch means which is electrically connected to said solenoid and is normally opened to deenergize said solenoid and is closed to energize said solenoid in response to said gear ratio lower than said predetermined value, and said second control means comprises second switch means which is electrically connected to said solenoid in parallel with said first switch means and is normally opened to deenergize said solenoid and is closed to energize said solenoid in response to a temperature of said engine below said predetermined value.

4,120,215

SAW CHAIN GRINDER

Peter D. Kaye, Monroe, Oreg., assignor to Bell Industries, Los Angeles, Calif.

Filed Feb. 27, 1976, Ser. No. 662,026
Int. Cl.[2] B23D 63/00
U.S. Cl. 76—25 A 11 Claims



1. A grinder for sharpening saw chain cutting teeth comprising:

a base;

a mounting bracket:

arcuate guide means disposed adjacent to said base for receiving said mounting bracket and enabling the mounting bracket to be angularly displaced therealong about a preselected, fixed reference axis;

a power-driven, rotary grinding wheel;

an elongate arm supporting said grinding wheel adjacent one end thereof, said arm having its other end pivotally connected to said mounting bracket obliquely thereto permitting selective movement of said grinding wheel toward and away from said base; and

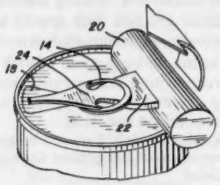
releasable clamping means connected to said base for supporting a length of saw chain with a selected one of its cutting teeth in position for sharpening by said grinding wheel, said clamping means including opposed, substantially parallel first and second elongate members adapted to receive saw chain links therebetween, and means connected to said elongate members selectively operable for simultaneously displacing said elongate members at an equal rate relative to a preselected datum line for clamping a saw chain link therebetween with the saw chain's lengthwise centerline substantially aligned and maintained, independently of saw chain width, on said datum line, said means for simultaneously displacing said elongate members including a clamp block and a clamp screw having a first threaded segment for engaging like threads in said clamp block, said clamp screw including a second threaded segment concentric with said first threaded segment, said second threaded segment having a thread lead twice that of said first threaded segment, and contacting means including a movable clamp nut threadably engaged with said second threaded segment, said movable clamp nut disposed between said clamp block and one of said elongate members, said clamp screw having abutment means arranged for abutment against the other of said elongate members so that when said clamp screw is rotated for further engagement with said clamp block, said abutment means and said movable clamp nut contact and simultaneously displace their associated elongate members at an equal rate toward said preselected datum line.

4,120,216

CAN OPENER FOR USE WITH RING-TYPE OPENER TABS

Norton Robert Goldberg, 8029 Keeler, Skokie, Ill. 60076

Filed Aug. 24, 1977, Ser. No. 827,249
Int. Cl.[2] B67G 7/40
U.S. Cl. 81—3.46 A 5 Claims



1. An opener for use with ring-type can opening tabs comprising:

an elongated handle;

head-insertion means sized and shaped for insertion into the ring of a pull-tab can, the head insertion means having force transmitting fulcrum means sized and shaped for insertion into the ring of a pull-tab can along with the head-insertion means;

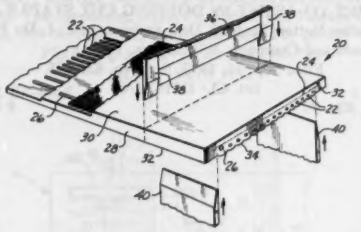
extension means connecting the head-insertion means to the handle thereby forming extension-handle and extension-head interfaces; and

the head-insertion means including: (a) tip means at the end thereof opposite the extension-head interface; and (b) means for gripping the pull-tab can ring adjacent the extension-head interface whereby the head-insertion means may be inserted in one direction in a gripping position within the ring of a pull-tab can and the can may be easily opened by exerting an upward and forward force in the other direction on the handle.

4,120,217
RIBBON CABLE SLITTER AND METHOD OF STRIPPING CABLE

Charles R. Rodd, and Richard L. Scheuerman, both of Redwood Falls, Minn., assignors to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Dec. 9, 1977, Ser. No. 858,932
Int. Cl.[2] H02G 1/12
U.S. Cl. 81—9.51 19 Claims



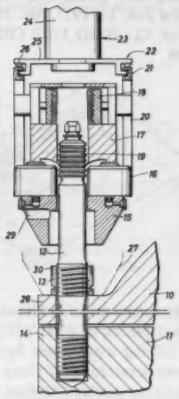
1. Apparatus for slitting a ribbon cable, said cable being of the class having a body of insulation material forming first and second opposite sides and edge portions and having a plurality of elongated conductors disposed in a first plane within said body between said first and second sides and having a metallic ground plane disposed in a second plane within said body between said first plane and said second side, said edge portions being disposed between said first and second sides and outside the bounds of said conductors, said apparatus comprising: first blade means for slitting said insulation material along the length of a portion of said cable between said edge portions and the bounds of said conductors from said first side to a depth approximately equal to the distance to said ground plane; second blade means for slitting through said cable across said edge portions; third blade means generally coplanar with said second blade means for slitting said insulation and ground plane between said edge portions from said second side to a depth at least as great as the distance to said ground plane; and operative means for simultaneously pressing said first, second and third blade means into said cable.

4,120,218
ARRANGEMENT FOR THREADING BOLTS INTO AND OUT OF TAPPED BORES OF REACTOR VESSELS

Kurt Tögel, Witten; Hans Warnke, Herne, and Horst Westerfeld, Castrop-Rauxel, all of Fed. Rep. of Germany, assignors to Klöckner-Werke AG, Duisburg, Fed. Rep. of Germany

Filed Sep. 8, 1977, Ser. No. 832,071
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1976, 2640991
Int. Cl.[2] B25B 29/02
U.S. Cl. 81—57.38 19 Claims

1. In an arrangement for threading connecting elements, particularly threaded bolts equipped with nuts threaded thereon, into and out of tapped bores especially to attach a lid to and detach the same from a reactor vessel, a combination comprising a carrier ring adapted to be supported on the lid during the threading operations; at least one lifting cylinder-and-piston unit mounted on said carrier ring and operative for tensioning a respective threaded bolt during a part of each of said operations; a double-rail track mounted on and extending over the entire circumference of said carrier ring with a spacing therefrom; and at least one bolt-rotating device supported on said track for displacement circumferentially of the same and operative for applying an axial force to the respective threaded bolt which substantially counterbalances the weight

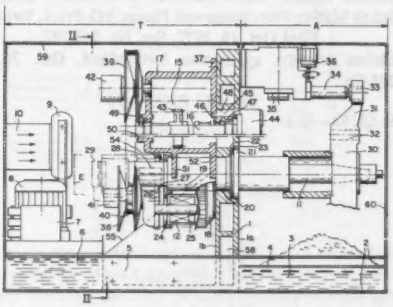


of the latter during a different part of each of said operations, and for rotating the respective counterbalanced threaded bolt.

4,120,219
TURNING MACHINE TOOL

Eberhard Van der Horst, Erkelenz, Germany, assignor to A. Monforts, Mönchengladbach, Germany

Filed Jul. 6, 1977, Ser. No. 813,332
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1976, 2630248
Int. Cl.[2] B23B 3/00, 19/02, 17/00
U.S. Cl. 82—2 R 6 Claims

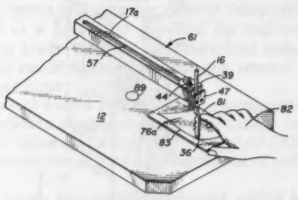


1. In a turning machine tool having a workpiece spindle and a tool turret shaft extending parallel thereto and including a transmission and drive means, a single free-standing front plate for supporting and bearing the spindle and the turret shaft, said front plate having a front side at which a working space is provided and a rear side on which the transmission and the drive means are mounted, the transmission having a housing and the spindle and the turret shaft being supported in bearing parts, said transmission housing and said spindle and turret-shaft bearing parts being mutually braced at a spacing from said rear side of said front plate so that, in said working space at said front side of said front plate, coordination of a workpiece placed on the spindle to the tools of the turret, is stabilized.

4,120,220
GLASS CUTTER APPARATUS

Wayne C. Mullen, 3291 Vivian Dr., Wheatridge, Colo. 80033

Filed Jan. 14, 1977, Ser. No. 759,296
Int. Cl.[2] B26D 3/08; C03B 33/00
U.S. Cl. 83—886 18 Claims

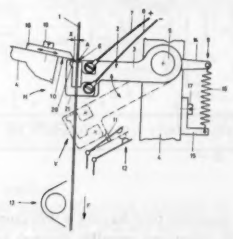


1. Glass cutter apparatus to facilitate the by hand cutting of intricately shaped pieces of glass comprising a support table with a surface having a sufficient hardness, smoothness and durability to resist scratching by sharp edges of cut glass providing a low friction contact surface for a sheet of glass, a cutter support arm disposed in spaced position with respect to said table, glass cutter receiving means on said arm, a glass cutter providing a glass scoring element engaged and held by said receiving means with the scoring element thereof disposed for spring biased pressured contact with glass in place on said contact surface of said table, and force adjusting means including spring bias means for changing the spring biased force exerted by said cutter and the scoring element thereof on the glass to be scored, said combination inclusive of the low friction table contact surface being useful when the user of said cutter apparatus for easy movement of the glass around said contact surface, moves the glass that is to be cut with respect to the cutter and its scoring element whereby score lines are provided outlining the intended segment pieces.

4,120,221
ARRANGEMENT FOR SEVERING WEBS

Francisco Speich, Gipf-Oberfrick, Switzerland, assignor to Jakob Müller, Forschungs-und Finanz AG, Frick, Switzerland

Filed Oct. 19, 1977, Ser. No. 843,782
Claims priority, application Switzerland, Oct. 20, 1976, 13281/76
Int. Cl.[2] B26D 7/10
U.S. Cl. 83—62.1 12 Claims

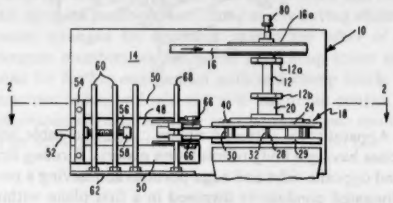


1. An arrangement for severing webs, particularly fabrics, of thermally severable materials, comprising a support; means for severing a respective web, including a severing tool having a severing portion, and means for heating at least said severing portion of said severing tool; means for so mounting said severing tool on said support that said severing portion contacts and severs the web during relative movement between the latter and said support and also for displacement of said severing tool relative to said support between an extended position and a retracted position in dependence on the resistance offered by the web to the severing action of said severing portion, including means for urging said severing tool toward said extended position thereof; and means for controlling the severing action of said severing portion by regulating the temperature of the latter, including a heat-conductive abutment member which is in a heat-transmitting contact with said severing tool at said severing portion thereof in said extended position, and out of such contact in said retracted position, of said severing tool.

4,120,222
STAPLE LENGTH CUTTER WITH LOW NOISE LEVEL JET TO ASSIST IN DOFFING CUT STAPLE

Jerry Fuller Potter, Seaford, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 16, 1977, Ser. No. 833,895
Int. Cl.[2] D01G 1/04
U.S. Cl. 83—99 8 Claims

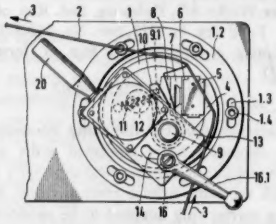


1. In an apparatus for cutting filamentary material into predetermined lengths comprising a cutting assembly including a plurality of knife edges secured to a reel having an upper and a lower mounting member and having means adapted to receive successive wrappings of filamentary material to be cut in contact with said plurality of knife edges and means for forcing said material between adjacent knife edges to a doffing point thereby severing said filamentary material into lengths of controlled dimensions, the improvement comprising means for removing the severed material, said means comprising: an orifice in said upper mounting member directed toward the proximity of the doffing point of the severed material; and means communicating with said orifice for continuously supplying pressurized fluid thereto.

4,120,223
APPARATUS FOR MAKING TAPES

Frank Bosse, Tecklenburg, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Oct. 13, 1977, Ser. No. 841,725
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1976, 2652011
Int. Cl.[2] B26D 1/10
U.S. Cl. 83—425.3 8 Claims



1. An apparatus for making tapes by longitudinally severing continuously fed film comprising:
a frame;
a guide rod mounted in said frame;
a set of juxtaposed cutting knives pivotably mounted on said guide rod, said knives having cutting edges with cutting

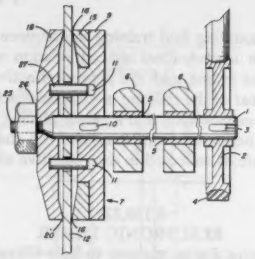
regions defined on the cutting edges for contacting and severing film; and

pivoting drive means for driving said set of juxtaposed cutting knives in such manner that the cutting regions move to and fro over the cutting edges while severing continuously fed film.

4,120,224
SAW BLADE MOUNTING ARRANGEMENT

Wade M. Van Steenberg, Sigel, Pa. 15860, and Florian O. Temchulla, 409 N. Penn. St., Punxsutawney, Pa. 15767

Filed Aug. 17, 1977, Ser. No. 825,224
Int. Cl.[2] B27B 5/32
U.S. Cl. 83—666 **4 Claims**



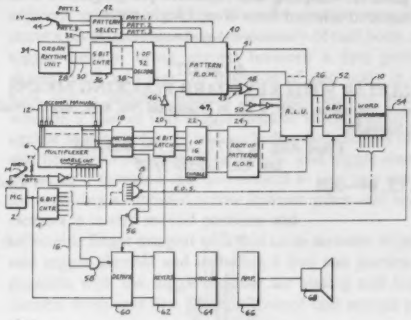
1. In a rotary saw having an arobr with a threaded end, drive means for rotating said arbor, a circular saw blade mounted on said arbor, said saw blade being mounted in substantially perpendicular relationship to the axis of said arbor, a solid collar mounted on said arbor at one side of said saw blade, a removable collar mounted on said arbor at the opposite side of said saw blade from said solid collar having an annular rim contacting the saw blade, and a retaining nut on said threaded end of said arbor forcing said collars toward each other, the improvement comprising an annular groove formed at the periphery of said solid collar, an annular insert in said annular groove, said annular insert having a rim adapted to contact a face of said saw blade, the diameter of said rim on said insert and the diameter of said rim on said removable collar being the same, whereby said rims contact the opposite faces of said saw blade when said retaining nut is tightened on the threaded end of said arbor to force said removable collar and said saw blade toward said solid collar.

4,120,225
METHOD AND APPARATUS FOR AUTOMATICALLY PRODUCING IN AN ELECTRONIC ORGAN RHYTHMIC ACCOMPANIMENT MANUAL NOTE PATTERNS

Ralph Nowack Dietrich, and John William Robinson, both of Jasper, Ind., assignors to Kimball International, Inc., Jasper, Ind.

Filed Jan. 17, 1977, Ser. No. 759,908
Int. Cl.[2] G10H 1/00
U.S. Cl. 84—1.03 **19 Claims**

1. The method of playing notes in a selected rhythmic pattern in an electronic organ having sound signal generator means, transducer means and keyers connecting the generator means with the transducer means, said organ having playing keys and multiplexing means for scanning said playing keys sequentially and including a counter driven by a high frequency clock and having a binary word output, said organ also having demultiplexer means responsive to binary data supplied thereto for actuating said keyers and synchronized with said multiplexer means, said method comprising: developing a respective first binary word in conformity with the depression of each of at least some of said playing keys forming pattern control kys, developing a first series of binary words in succession according to a selected rhythmic pattern and substantially slower than the frequency of the multiplexer clock, sequentially combining said first binary word with each word of said first series of binary words to develop a second series of binary words, comparing each word of said second series of binary

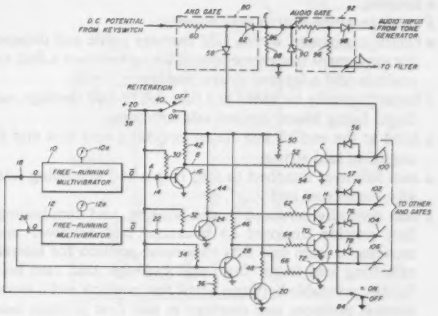


words with the binary word output of said counter, and supplying a pulse to said demultiplexer means each time the compared words are equal.

4,120,226
CIRCUIT FOR REITERATING PERCUSSIVE SOUNDS IN ELECTRONIC MUSICAL INSTRUMENT

Robert A. Finch, Palos Park, Ill., assignor to CBS Inc., New York, N.Y.

Continuation of Ser. No. 680,220, Apr. 26, 1976, abandoned.
This application Jul. 7, 1977, Ser. No. 813,641
Int. Cl.[2] G10F 1/00
U.S. Cl. 84—1.03 **7 Claims**



1. In an electronic organ having a plurality of keyswitches wherein actuation of each keyswitch acts to apply as one of two inputs to a respective one of a like plurality of logic gates a DC potential of predetermined amplitude, and wherein conduction of a logic gate acts to cause an associated one of a like plurality of audio gate circuits to couple from a tone generator to output utilization means a single note of a musical scale corresponding to the actuated keyswitch, a reiteration circuit for automatically reiterating a sound corresponding to a note for so long as the keyswitch for that note is depressed to produce percussion effects, said system comprising:

pulse generating means for producing a repetitive substantially rectangular waveform pulse signal having a first voltage level during a substantially greater portion of each cycle than it has a second voltage level, which first level being sufficient when applied as a second input to a logic gate simultaneously with application of said DC potential as a first input to render said logic gate conducting and said second level being incapable of rendering a logic gate conducting when applied thereto simultaneously with the

application of said DC potential, whereby to minimize the chance of a keyswitch being actuated when said repetitive pulse signal is at said second level; and

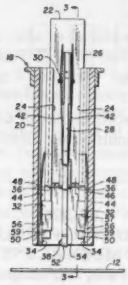
means connecting said pulse generating means to said logic gates for coupling said repetitive pulse signal as a second input to selected ones of said logic gates.

4,120,227

GUITAR WITH KEYBOARD PLUCKING MEANS

Jaime A. Bolaños, Edif. F.G. la Diagonal No. 424, San Salvador, El Salvador

Filed Aug. 4, 1977, Ser. No. 821,843
Int. Cl.[2] G10D *3/16*
U.S. Cl. 84—320 **7 Claims**



1. For use in a multiple string musical instrument, a plurality of plucking means arranged in an array across said instrument with each plucking means adjacent a string corresponding thereto, each said plucking means comprising:

a housing;

a carriage guide within said housing;

a carriage mounted within said carriage guide and disposed for movement transverse to said string between a first rest position and a second stroke position;

a finger pivotally mounted at a first end to said carriage, said finger being biased against said carriage;

a head at the end of said finger opposing said first end for engaging said string;

a cam follower attached to said finger and extending laterally therefrom; and

a cam pivotally mounted to said housing, said cam having a face portion disposed to intercept said follower upon movement from said first to second position for laterally offsetting said finger from said carriage, said cam being further pivotable between a first rest position and a second nonrest position; said carriage in said first position being operative to urge said follower toward said face portion including a corner permitting a lateral return displacement upon movement of said carriage toward said stroke position, and said cam being movable to said second cam position only upon encounter with said follower upon movement of said carriage from said stroke position to said carriage rest position whereby said head is moveable in an eccentric path for stroking a string and permitting free vibration of said string thereafter.

4,120,228

HAND HELD MOUTHPIECE VISUALIZER FOR INTERIOR EMBOUCHURE

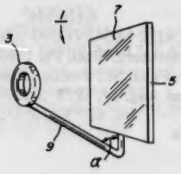
Howard Windows, Jr., 23 Linden St., Natrona, Pa. 15065

Filed Feb. 22, 1977, Ser. No. 770,394
Int. Cl.[2] G09B *15/00*
U.S. Cl. 84—453 **2 Claims**

1. A training device for developing the proper interior embouchure of brass instrument players comprising:

a brass instrument training mouthpiece in the form of an annular member having the dimensions of the rim of a selected brass instrument mouthpiece which provides visual observation of the interior embouchure from the rear of the training mouthpiece when the player's lips are applied to the front thereof;

a body member having a planar reflective surface; and



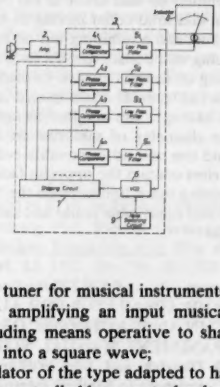
means for mounting said training mouthpiece to said body member in unobstructed spaced relation with said rim parallel and in line with the planar reflective surface and with the rear of the training mouthpiece facing the planar reflective surface such that a player placing his lips to the front of the mouthpiece may observe the full interior embouchure as reflected in the reflective surface.

4,120,229

ELECTRONIC TUNER

Kyozo Ota, Fuchu, Japan, assignor to Keio Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1975, Ser. No. 643,054
Claims priority, application Japan, Dec. 30, 1974, 50-1813
Int. Cl.[2] G10G *7/02*
U.S. Cl. 84—454 **8 Claims**



1. An electronic tuner for musical instruments comprising:

an amplifier for amplifying an input musical signal, said amplifier including means operative to shape said input musical signal into a square wave;

a reference oscillator of the type adapted to have its oscillation frequency controlled by a control voltage to produce a reference oscillation signal of controlled frequency;

a phase comparator coupled to said oscillator and to said amplifier for comparing the amplified musical sound signal in phase with said reference oscillation signal;

a waveform shaping circuit for shaping the oscillation signal from said reference oscillator into a square wave, said waveform shaping circuit comprising a plurality of frequency dividers connected in cascade and supplied with said reference oscillation signal to frequency divide said reference oscillation signal, and an AND gate for obtaining the logical product of the outputs from the frequency dividers and for supplying the phase comparator with said logical product in the form of a signal containing a higher harmonic;

said phase comparator comprising a multiplier for multiplying the square wave musical signal from the amplifier by the output from the waveform shaping circuit;

a low-pass filter for extracting the low-frequency compo-

nent from the output of said phase comparator and applying it as the control voltage to said reference oscillator; and

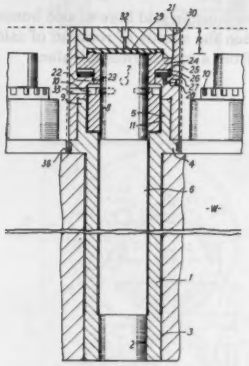
an indicator connected to the output of said low-pass filter and responsive to said control voltage for providing a direct visual indication of the ratio between said reference oscillation signal and the frequency of said input musical signal.

4,120,230

SELF-STRAINING BOLTS

Thomas Walter Bunyan, London, England, assignor to Pilgrim Engineering Developments Limited, London, England

Filed Feb. 23, 1977, Ser. No. 771,092
Int. Cl.[2] F16B *31/04*; B23P *11/02*
U.S. Cl. 85—1 T **14 Claims**



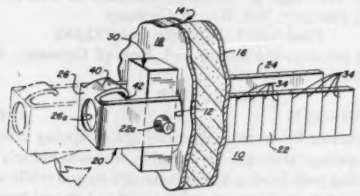
1. A compound bolt comprising a hollow shank, a core member within the hollow shank, the shank and core member being secured to each other against relative axial movement in both directions at or adjacent a first end of the bolt assembly, releasable transfer means at or adjacent the second end of the assembly for transferring tension forces from the core member to the hollow shank, the core member being capable of withstanding in compression the normal tensile force generated in the shank in use when such force is transferred thereto by the transfer means, and coupling means at or adjacent the second end of the core member for applying tensile and compressive forces to the core member.

4,120,231

HOLLOW WALL FASTENER

George A. Neumayer, 890 Brand La., Deerfield, Ill. 60015

Filed Feb. 10, 1977, Ser. No. 767,542
Int. Cl.[2] F16B *37/04*
U.S. Cl. 85—3 R **7 Claims**



1. A hollow wall fastener for insertion in a hole formed in a wall panel between inner and outer faces comprising:

an elongated body adapted for longitudinal insertion in said hole from said outer face toward said inner face, said elongated body including a pair of spaced apart legs having free outer ends and opposite inner end portions interconnected by an integral cross member;

a toggle element pivotally mounted between said legs on axles extending into circular openings fixed in said legs adjacent said inner end portions for pivotal movement about a pivot axis extending transversely of said body, said toggle element being pivotal between a first position aligned with said legs for insertion of said body in said hole and a second position generally normal thereto wherein a face of said toggle element is adapted to bear against said inner face of said wall after said element clears said hole upon insertion of said body, said toggle element including a threaded aperture normal to said face thereof for receiving a threaded screw fastener when said toggle element is in said second position; and

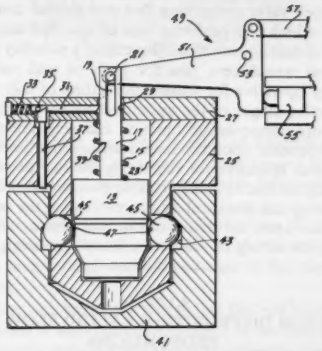
a deflectable finger integral with said cross member adjacent said toggle element and including a free end portion engageable with the toggle element for biasing said toggle element from said first position toward said second position.

4,120,232

SOCKET LUG ASSEMBLY FOR AIRCRAFT STORES

Charles R. Hoffman, Jr., Fort Walton Beach, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 14, 1977, Ser. No. 787,680
Int. Cl.[2] B64C *1/22*; F16D *1/00*; F41F *5/02*
U.S. Cl. 89—1.5 R **3 Claims**



1. A socket lug assembly for releasably attaching a store and the like to a bomb rack on an aircraft, said socket lug assembly comprising a cylindrical spindle positioned in a block for vertical slidable movement therein, said spindle having a reduced diameter at the lowermost end portion, a rod member extending upwardly from said spindle, a coil spring disposed around said rod member for urging said spindle downward, a lug for attaching a store thereto positioned over the outer lower end of said block, a groove on the inner wall surface of said lug, a plurality of metal spheres positioned in the groove in said lug and in contact with an inclined surface on said spindle, said groove having an inclined upper surface for forcing said plurality of metal spheres inwardly against the inclined surface of said spindle in response to additional downward force applied to said lug, and means for providing upward movement to said rod member with said spindle attached such that the reduced diameter of said spindle is in line with the metal spheres allowing said plurality of spheres to move inwardly out of the groove in said lug thereby releasing said lug from said block.

4,120,233
HYDRAULIC CONTROL SYSTEM FOR AT LEAST TWO CONSUMERS

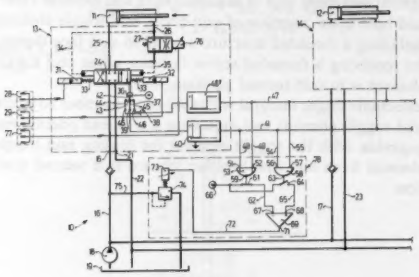
Joachim Heiser, Stuttgart; Wolfgang Bernhardt, Korntal, and Roland Schempp, Abstatt, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 24, 1977, Ser. No. 809,936

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1976, 2630468

Int. Cl.[2] F15B *11/16*

U.S. Cl. 91—511 **10 Claims**



1. In an hydraulic control system for controlling the delivery of pressure fluid to at least two hydraulic consumers, in combination, a plurality of pressure-compensated direction-reversing valves, one for each consumer, each valve performing a direction-control function for determining the direction of flow of fluid in the system, a throttling function for determining the smallest flow cross-section in the system, and a pressure-compensation function for determining the line pressure in the system, each valve comprising first and second control valve stages of which one performs two of said functions and the other the remaining one of said functions; a plurality of electromechanical transducers, one for each of said valves, each transducer operative for sensing the setting of that one of the control valve stages of the associated valve which performs the pressure-compensation function and generating electrical signals dependent upon the sensed setting; line pressure regulating means operative for regulating the line pressure in the system; and an electrical information-processing unit operative for receiving said electrical signals, evaluating the same, and in dependence upon the results of the evaluations automatically adjusting the setting of the line pressure regulating means.

4,120,234
DEVICE FOR DISTRIBUTING A FLUID FLOW IN FIXED PROPORTIONS

Karl Evert Anders Joelson, Lenhovda, Sweden, assignor to AB Vabyma, Sweden

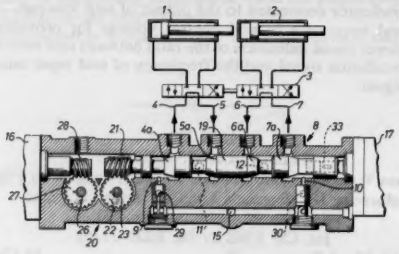
Continuation of Ser. No. 579,908, May 22, 1975, abandoned. This application Feb. 16, 1977, Ser. No. 769,218

Claims priority, application Sweden, Jul. 1, 1974, 7408672

Int. Cl.[2] F15B *11/22*

U.S. Cl. 91—518 **13 Claims**

1. A device for distributing fluid from a source of pressurized fluid to first and second consumers while maintaining a fixed ratio between the fluid flows to said consumers, including a valve device connected between said source and said consumers and comprising a housing having a bore and a valve slide rotatably and slideably fitted in said bore in said housing and provided with consumer inlet valves adapted to regulate the fluid flow from said source for pressurized fluid to said consumers in dependence upon the axial position of said valve slide, displacement type rotary flow value gauges, means for directing fluid flow consumed by said consumers to an associated gauge, a comparator interconnecting said gauges for sensing the ratio between the fluid flows through said gauges and including two self-locking worm gears with transmission means between them, said valve slide being coupled to the worm of one of said worm gears so as to rotate with said worm



and so as to be displaced in said bore of said housing when the proportion between the speeds of rotation of said flow value gauges deviates from a predetermined value.

4,120,235
APPARATUS FOR TRANSVERSELY SEALING A WRAPPING TUBE

Otto Beck, Stuttgart-Heumaden, and Klaus Hamm, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 1, 1977, Ser. No. 783,662

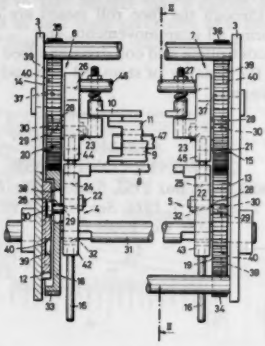
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1976, 2614990

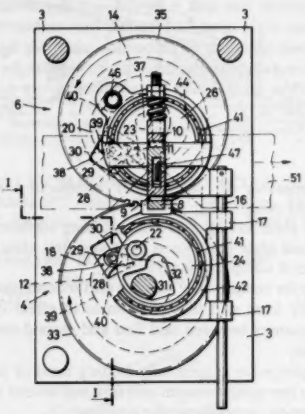
Int. Cl.[2] B31B *1/64*

U.S. Cl. 93—33 H **11 Claims**

1. Apparatus for transversely sealing a wrapping tube comprising: opposed sealing tools movable in unison linearly along an operating path having a beginning and an end while sealing a wrapping tube and returning from said end to said beginning by moving along arcuate return paths, crank mechanisms for so moving said tools and including cam tracks and cooperating cam followers, said cam followers being urged against said cam tracks under the influence of centrifugal force during movement of said tools along said return paths; interconnect-

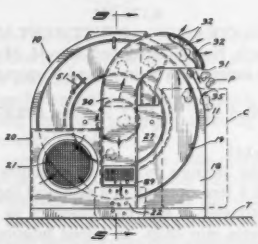
ing guide means for guiding said tools along said paths; and wherein said tools are mounted on carriers and said guide





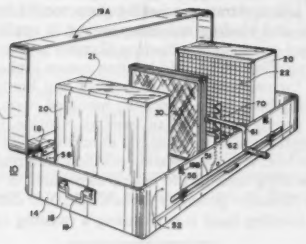
means extends substantially perpendicular to said operating path.

4,120,236
CORN POPPER
James K. Blomberg, Minneapolis, Minn., assignor to The Popper's Choice Company, Minneapolis, Minn.
Filed Oct. 25, 1977, Ser. No. 844,650
Int. Cl.[2] A23L *1/18*
U.S. Cl. 99—323.9 **8 Claims**



1. In a popcorn popper,
(a) an outer housing,
(b) a roasting drum mounted in the housing for rotation on its horizontal center axis,
(c) drive means for rotating the drum,
(d) said drum having a popping chamber and a discharge chamber,
(e) heating means for heating the popping chamber,
(f) means for depositing corn kernels in the popping chamber for popping therein as the drum is rotated,
(g) separator means between the popping chamber and discharge chamber for directing corn kernels after they are popped into the discharge chamber, and
(h) means for discharging popped corn from the discharge chamber and out of the roasting drum while the drum continues to rotate.

4,120,237
VERTICAL BARBECUE
Otto Mecherlen, Queens Village, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Filed Apr. 11, 1977, Ser. No. 786,268
Int. Cl.[2] A47J *33/00, 37/07*
U.S. Cl. 99—340 **2 Claims**

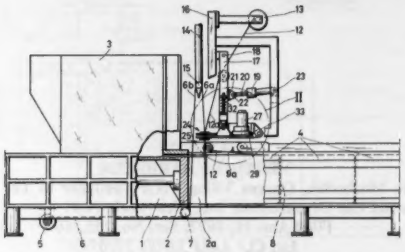


1. A barbecue unit, the outer housing of which is shaped as a carrying case formed of a base section hinged to a cover section, said base and cover sections each shaped as an open box, with
a pair of similar burner units each in the form of a box fitted with a grate unit as the face side of the burner unit, said boxes each formed with a side hinged to the remainder of the box,
said burner unit boxes of a size so that the two boxes may be contained in side-by-side orientation in the base section of the housing and each of a height to extend beyond the rim of the base section in said orientation,
means to fix said boxes in an erect position in spaced relation to each other inside the base section with the face side of each burner unit facing the other, and
detachable means to mount a rotisserie bar to said base unit between said burner unit boxes in the erect position, together with a grill unit formed of a pair of grill plates hinged together, with one of said plates fitted with means to slidably engage the rotisserie bar in a non-rotatable fashion relative to said bar,
said grill plates each fitted with first means to detachably latch the two grill plates together when said plates are folded in parallel array to each other, and with each grill plate fitted with second means to alternatively detachably engage each grill plate with the face side of an individual burner unit so that in the unfolded mode of the grill plates, and the side-by-side orientation of the burner unit boxes both grill plates extend in a substantially common plane over the face sides of the burner units, to which they are detachably fastened.

4,120,238
BALE BINDING APPARATUS WITH RESILIENTLY MOUNTING FILAMENT TWISTING MECHANISM

Anton Schäfer, Langenfeld; Karl Probst, Solingen, and Kurt Hüfken, Krefeld, all of Germany, assignors to Lindemann Maschinenfabrik GmbH, Dusseldorf, Germany

Filed Jun. 20, 1977, Ser. No. 808,319
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1976, 2628540
Int. Cl.[2] B65B *13/28*
U.S. Cl. 100—11 11 Claims

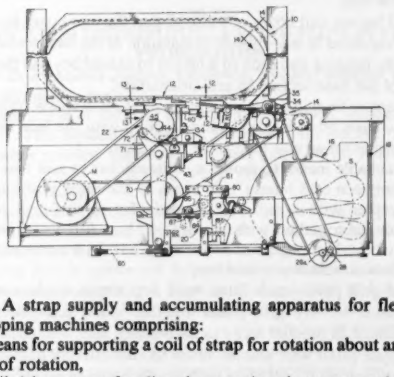


1. In apparatus for applying binding filaments about bales of material, said apparatus including press means for producing said bales, and binding means operating to apply about each bale at least one loop of a binding filament arranged to extend within a winding plane, said binding means including a twisting head for twisting together ends of said binding filament, said twisting head being moveably mounted upon said apparatus to be swung in and out of twisting position, the improvement comprising means resiliently mounting said twisting head when said head is in said twisting position, said resilient mounting means being arranged to enable movement of said twisting head in a direction generally toward said bale during the time that said twisting head is performing a twisting operation.

4,120,239
STRAPPING MACHINE

James A. Pasic, and Marvin I. Berg, both of Montesano, Wash., assignors to Ovalstrapping, Inc., Hoquiam, Wash.

Filed Mar. 10, 1977, Ser. No. 776,140
Int. Cl.[2] B65B *13/32*
U.S. Cl. 100—26 25 Claims



1. A strap supply and accumulating apparatus for flexible strapping machines comprising:

means for supporting a coil of strap for rotation about an axis of rotation,

coil drive means for directly engaging the strap on the peripheral surface of the coil for rotating said coil,

an accumulating compartment having an inlet and an outlet, feed roll means located at said compartment inlet for moving strap into said inlet,

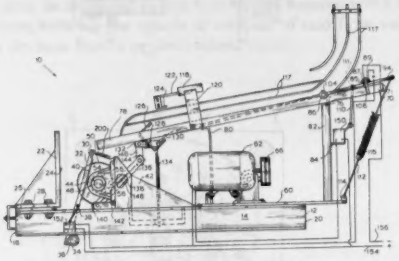
means coupling said coil drive means to said feed roll means for substantially synchronous rotation of the feed roll means and coil drive means whereby the linear speed of the strap leaving the coil and the linear speed of the strap passing through the feed roll means are approximately equal during all strap movements, and

means for controlling said coil drive and feed roll means for varying the quantity of strap fed into said accumulating compartment.

4,120,240
CONTAINER COMPACTOR

George L. Smith, P.O. Box 2153, Sanford, Fla. 32771

Filed Sep. 7, 1976, Ser. No. 720,965
Int. Cl.[2] B30B *15/30*
U.S. Cl. 100—45 13 Claims



1. Apparatus for sequentially compacting a plurality of containers comprising:

a first plate having a first compacting surface;

a second plate juxtaposed with said first plate and having a second compacting surface;

means for reciprocally moving said second plate toward and away from said first plate so as to effect compacting of containers between said first and second compacting surfaces;

a magazine for sequentially feeding most of said containers into the space between said first and second plates when in an open, noncompacting position;

means for energizing said reciprocal moving means responsive to the weight of a predetermined number of said containers in said magazine and continuously operating said moving means during any energization cycle thereof until most of said predetermined number of containers are compacted;

a first shaft; and

means coupling said moving means and said sequential feeding means to said first shaft so that each is commonly operative responsive to rotation of said first shaft.

4,120,241
FEEDER PENETRATION ADJUSTMENT MECHANISM

Charles A. Smith, New Holland, and John H. Merritt, Ephrata, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

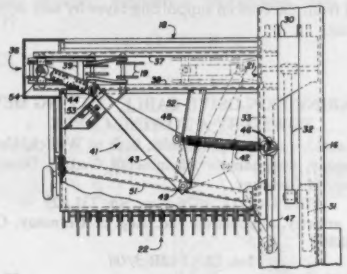
Filed Aug. 19, 1977, Ser. No. 825,873
Int. Cl.[2] B30B *5/00*
U.S. Cl. 100—142 9 Claims

5. A hay baler having a fore-and-aft extending bale chamber provided with a feed opening in a side wall thereof, a driven plunger reciprocable in said bale chamber to compress hay deposited therein into bales, an infeed housing substantially perpendicular to and in alignment with said feed opening, a feed mechanism nounted within said infeed housing for reciprocable movement therein toward and away from said feed opening, a drive linkage connected between said plunger and said feed mechanism including

a main pivot arm having a first end and a second end, said

first end of said main pivot arm pivotally fixed at a point spaced from said feed mechanism and said plunger;

a spring-biased telescoping arm having a first end pivotally connected to said plunger and a second end pivotally connected to said main pivot arm at a location spaced from said first end of said main pivot arm;



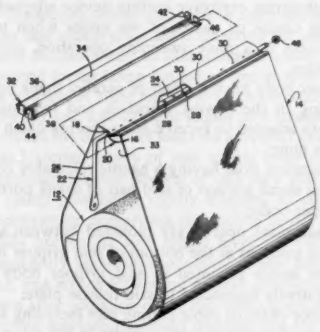
an adjustable length arm having a first end pivotally connected to said second end of said main pivot arm and a second end pivotally connected to said feed mechanism, whereby adjustment of said adjustable length arm controls the relative movement between said plunger and said feed mechanism.

4,120,242

BULKY MATERIAL COMPACTER

Joseph Vosbikian, 617 Ashmead Rd., Cheltenham, Pa. 19012, and John R. Kalalian, 1004 Shadeland Ave., Drexel Hill, Pa. 19026

Filed Oct. 28, 1977, Ser. No. 846,438
Int. Cl.[2] B30B *5/04*
U.S. Cl. 100—212 **13 Claims**



1. A compacter for maintaining a bulky compressible item in a tightly rolled condition to make the item easily transportable, said compacter including:

a flexible strap for encircling the compressible material, said strap having opposed laterally extending end margins adjacent to each other;

a rotatable, rigid winder for use in rolling up the strap from both of its end margins, said winder including an elongate section extending laterally across the strap and about which the strap is rolled up, and a lever section connected to the elongate section to provide a mechanical advantage for rotating the elongate section of the winder to roll up the the strap tightly around the compressible material; and

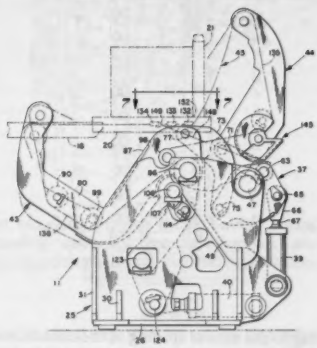
a latching means connected to the lever section of the winder to prevent the winder from turning in a direction to unroll said strap.

4,120,243

BUNDLE COMPACTOR

Irving Leonard Kaplan, Pepper Pike, Ohio, assignor to Carl Krasny & Associates, Inc., Warrensville Heights, Ohio

Filed Mar. 29, 1977, Ser. No. 782,494
Int. Cl.[2] B30B *5/04*
U.S. Cl. 100—212 **40 Claims**



1. A bundle compactor for elongated elements comprising two arm assemblies mounted for movement between open and closed positions, a flexible element extending between the distal ends of said arm assemblies and in the closed position thereof encircling the bundle, the distal end of at least one of said arm assemblies being furcated symmetrically with respect to the distal end of the other arm assembly so that such distal ends may interfit, and said flexible element being furcated accordingly, whereby, when said flexible element is tightened when said arm assemblies are closed, the compacting force will be evenly distributed about a plane normal to the axis of the bundle.

4,120,244

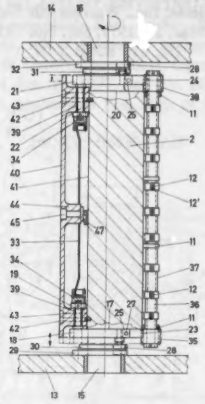
GRIPPER MOVEMENT CHANGEOVER DEVICE ON A SHEET-TURNING DRUM FOR PERFECTOR PRINTING MACHINES

Arno Wirz, Bammental, Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Germany

Filed Feb. 7, 1977, Ser. No. 765,903
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1976, 2604895
Int. Cl.[2] B41F *21/04*
U.S. Cl. 101—230 **5 Claims**

1. Gripper movement changeover device on a sheet-turning drum for perfector printing machines having two drive members for the gripper movement located at opposite ends of the drum, the drive members being pivotable about pivot pins, each of the drive members carrying a roller selectively engageable with either one of two coaxially disposed control cams located adjacent the ends of the drum for following the cams comprising a bridge disposed in a cavity formed in the sheet-turning drum, said bridge extending over the length of the sheet-turning drum, a plate fastened in said cavity and formed with a slot, an eccentric bolt mounted in said bridge and having an eccentric pin engaging in the slot formed in said plate, the drive members being movably mounted on said bridge for displacement together with said bridge axially of the drum,

whereby upon rotation of said eccentric bolt against said slot, said bridge is caused to be longitudinally displaced a distance



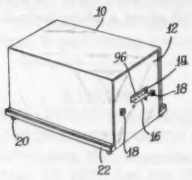
corresponding to the mutual spacing of the control cams of the respective drive members.

4,120,245

LABEL PRINTER

Edward C. Karp, Belvidere, and Charles Emile De Croix, Woodstock, both of Ill., assignors to Sanitary Scale Company, Belvidere, Ill.

Filed Jan. 10, 1977, Ser. No. 758,072
Int. Cl.[2] B41J *15/02, 11/08, 11/20*
U.S. Cl. 101—288 **7 Claims**



1. A label printer for printing information on a tape having a print-receptive layer and a supporting layer, said label printer comprising:

a supply spool for the tape;

a unitary, adjustable platen having a tape-supporting surface disposed to receive tape from said supply spool from a tape ingress end to an opposing tape egress end, said tape ingress end resting on a pivoting bar disposed perpendicularly to the path of tape feed for pivoting the platen about the axis of the pivoting bar, and said tape egress end terminating in a delaminating bar;

a printing head disposed above but closely adjacent to the tape egress end of said platen for printing information on the print-receptive layer of tape;

a spring disposed to urge the tape egress end of said platen downwardly away from the printing head;

platen adjusting means including a fixed screw support and a pair of adjustment screws threaded through said screw support such that the ends of said screws bear on said tape egress end of said platen for urging said tape egress end upwardly against the bias of said spring;

tape advancement means disposed downstream of said delaminating bar and engaging the supporting layer of tape for advancing the tape over said platen and delaminating bar;

a take-up spool for the supporting layer of tape; and

means for driving said tape advancement means in synchronism with the line printing function of said printing head;

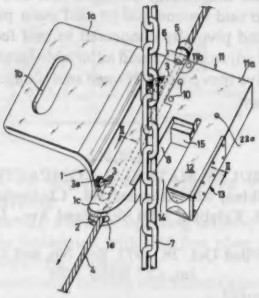
whereby the adjustment of said screws causes said platen to pivot about said pivoting bar to position the tape egress end of the platen relative to the printing head and simultaneously adjust the delaminating bar to its proper height, and the printed upon print-receptive layer of tape is separated from the bottom supporting layer by said delaminating bar.

4,120,246

SUBMARINE EXPLOSIVE CABLE CUTTING DEVICE TOWED BY A TOWING CABLE

Udo Sabranski, and Jochen Schmitt, both of Willich, Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Oct. 12, 1976, Ser. No. 731,829
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1975, 2548595
Int. Cl.[2] F42B *3/08*
U.S. Cl. 102—24 HC **22 Claims**



1. A submarine explosive cutting device adapted to cut the anchoring chains or cables of sea mines when towed by a towing cable in a mine sweeping operation, comprising in combination,

a gripper body having a pair of parallel shank portions projecting in the towing direction and forming a gripper mouth adapted to receive an anchoring chain or cable of a sea mine;

a stabilization float having a handle releasably connected to a first shank portion of said pair of shank portions of said gripper body;

a release plate operatively mounted between said pair of shank portions at the bottom of said gripper mouth;

ignition means mounted in said gripper body and being operatively connected to said release plate;

an anchor chain or cable cutting unit including an explosive charge disposed at least partially in the other one of said pair of shank portions and being adapted to coact and be detonated by said ignition means;

said stabilization float having a portion with a groove extending along said first shank portion which is adapted to receive the towing cable and further having towing cable protecting means extending along said first shank portion at one side of said gripper mouth;

locking means operatively mounted on said stabilization float and adapted to prevent the towing cable separating from said cutting device; whereby said gripper body which includes the anchor chain or cable cutting unit is releasably connected to the stabilization float of the cutting device in such a way that when a predetermined force, applied to said gripper body, is exceeded said gripper body is sheared off the remainder of said cutting device.

4,120,247

CLAMP COUPLING ON A SUSPENSION GEAR OF A CIRCULAR SUSPENSION RAILWAY

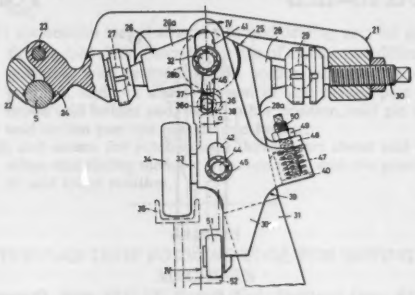
Werner A. Müller, Bern, and Hans Abegglen, Hinterkappelen, both of Switzerland, assignors to Von Roll AG, Departement Bahn- und Stahlbau, Bern, Switzerland

Filed Mar. 9, 1977, Ser. No. 775,878

Claims priority, application Switzerland, Feb. 15, 1977, 1851/77

Int. Cl.[2] B61B *12/12*

U.S. Cl. 104—208 4 Claims



1. In a suspension gear of a continuous wire ropeway which includes a haulage-and-support cable, wherein the coupling of the suspension gear to said haulage-and-support cable is effected and sustained by the net weight of the suspension gear, a clamp coupling comprising a rack, a fixed clamp jaw firmly affixed to said rack, a movable clamp jaw mounted on said rack, a suspension gear support bar, a control carriage, and a toggle lever mechanism connecting said movable clamp to said suspension gear support bar and to said control carriage, said toggle lever mechanism being supported on said rack and including a first and a second lever, two universal joints respectively connecting one of the levers to a portion of said rack spaced from said clamp jaws and connecting the other one of said first and second levers to said movable clamp jaw, said first and second levers being hinged to one another about an axis which extends at right angles to the longitudinal axis of said support bar and also at right angles to a straight line extending between the centers of said two universal joints, one of said first and second levers of said toggle lever mechanism which is mounted on said portion of said rack that is spaced from said clamp jaws being rigidly attached to said support bar, the improvement comprising obstruction device means for automatically preventing said toggle lever mechanism from buckling upwardly upon the application of side loads on said support bar, and means for setting up said obstruction device for operation after actuation of the movable clamp jaw of said clamp coupling towards its closed position and for rendering said obstruction device inactive before actuation of said movable clamp jaw of said clamp coupling towards its open position.

4,120,248

ILLUMINATED DECORATIVE TABLES

Ronald Broach, 1108 Franklin Ave., Apt. 2, Cincinnati, Ohio 45237

Filed Nov. 24, 1975, Ser. No. 634,453

Int. Cl.[2] A47B *85/00*

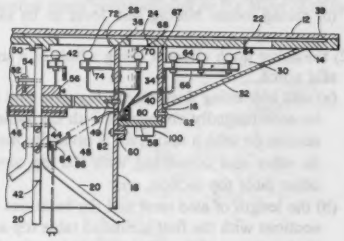
U.S. Cl. 108—23 8 Claims

1. A decorative table comprising

a horizontally disposed light transmitting top unit, said top unit including an upper planar surface and an underlying planar disc having patterned light transmitting portions,

a plurality of illuminating means disposed and attached to a supporting disc, beneath said top unit for illuminating the respective light transmitting portions,

a powered means for sequentially and momentarily actuating said illuminating means, and



a floor engaging support means having a supporting shaft extending upwardly from said support means engaging and supporting said top unit and said illuminating means.

4,120,249

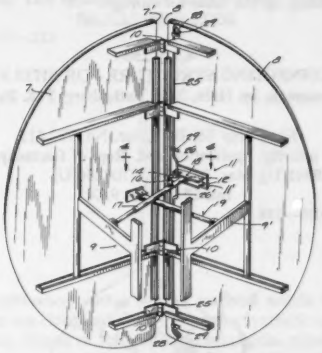
FOLDING TABLE EQUIPPED WITH IMPROVED LATCH MECHANISM THAT HOLDS TABLE TOP SECTIONS COPLANAR AND PREVENTS ACCIDENTAL INJURY DURING UNFOLDING

Robert O. Blink, Greenfield, and William C. Lutzke, Milwaukee, both of Wis., assignors to Mitchell Manufacturing Company, Milwaukee, Wis.

Filed Aug. 8, 1977, Ser. No. 822,443

Int. Cl.[2] A47B *3/091*

U.S. Cl. 108—113 6 Claims



1. In a folding table of the type in which the top of the table has hingedly connected sections that have adjacent edges and are coplanar when the table is unfolded and set up for use,

wherein each of said table top sections has leg means hingedly connected thereto, and leg struts connecting the leg means of one table top section with the other table top,

wherein the axis of the hinge connection between the table top sections is so located with respect to the adjacent edges of the table top sections that those edges are closely contiguous when the table top sections are coplanar,

improved means for eliminating the hazard of accidentally pinching one's fingers between the adjacent edges of the table top sections as those edges approach contiguity during unfolding of the table, and which comprises:

A. coacting latch elements operable upon being brought into a predetermined engaged relationship, to hold the table top sections against unintended displacement out of coplanar relationship,

(1) one of said latch elements being a lever pivotally mounted at the underside of one of the table top sections

to swing about an axis spaced from and parallel to that of the hinged connection between the table top sections, to and from a defined position in which one edge of said lever faces the hinge axis but is spaced therefrom,

(a) said edge having a notch, and

(b) spring means biasing said lever to its said defined position,

(2) the other latch element being a bolt of a size to fit in said notch,

(a) said bolt being fixed on the leg strut that has one of its ends hingedly connected with the same table top section on which said lever is pivotally mounted and its other end connected with the leg means of the other table top section, and

(b) the length of said strut and the locations of its connections with the first identified table top section and the leg means of the other table top section being such that as the table top sections approach coplanar orientation, the bolt carried by said strut collides with said edge of said lever at a point spaced from its notch and thereby blocks further movement of the table top sections towards coplanar orientation as long as said lever remains in its said defined position; and

B. means including at least one manually actuatable handle for moving said spring biased lever out of its said defined position,

said manually actuatable handle being movably mounted at the underside of one of the table top sections and being connected with said lever to swing the same about its pivotal mounting in opposition to the biasing force thereon, far enough to permit entry of said bolt into said notch during unfolding of the table for use and to permit said bolt to leave said notch preparatory to folding up the table for storage.

4,120,250

CONNECTING STRUCTURE FOR SHELVES

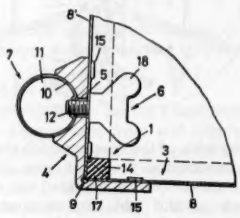
Hans Viessmann, Im Hain, 3559 Battenberg, Fed. Rep. of Germany

Filed May 16, 1977, Ser. No. 797,411

Claims priority, application Fed. Rep. of Germany, May 19, 1976, 7615841[U]; Mar. 22, 1977, 7708836[U]

Int. Cl.[2] A47B 9/00

U.S. Cl. 108—144 **24 Claims**



1. A connecting structure for shelves comprising:

a plurality of vertical supporting members having a predefined profile and having at least one hole therein,

a tray held in a substantially horizontal orientation by said supporting members and having substantially vertical flank faces and corner edges therebetween,

a plurality of L-shaped elbows defined by first and second legs secured to adjacent flank faces of said tray adjacent the corner edges thereof and covering the same, each of said elbows having at least one punch-through opening through one of said two legs thereof to receive therethrough screw means for connection of one of said flank faces of said tray to one of said supporting members at the hole provided therein.

4,120,251

AUTOMATIC METHOD AND APPARATUS FOR CLOSING A TOE END OF A SEAMLESS HOSE MATERIAL UTILIZING A STRAIGHT LINE STITCHING BY MEANS OF A STATIONARILY DISPOSED SEWING MACHINE

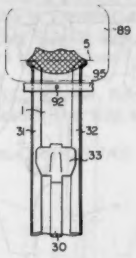
Osho Takatori, Nara; Etsuo Nishikawa, Goze, and Yosinobu Fukuyama, Kashihara, all of Japan, assignors to Takatori Machinery Works, Ltd., Yamatotakada, Japan

Filed Aug. 24, 1976, Ser. No. 717,133

Claims priority, application Japan, Jun. 11, 1976, 51-67598

Int. Cl.[2] D05B 19/00, 21/00

U.S. Cl. 112—121.15 **8 Claims**



1. Apparatus for closing seamless hose material comprising

a stationarily disposed sewing machine;

a frame;

a plurality of holding members for holding a seamless hose material respectively thereon, said holding members being mounted on said frame for movement along said frame laterally to the front of said sewing machine;

a pair of finger pieces mounted on each said holding member, said pair of finger pieces having free ends and each finger piece having a projection at a respective free end which projects outwardly from a side of each said finger piece;

means for moving each respective finger piece of each pair of finger pieces laterally with respect to each other;

a hose guiding pin device moving synchronously along with each said holding member in a parallel direction, each said pin device being disposed between a respective pair of said finger pieces to fixedly support a seamless hose material at an intermediate region in such a manner that a one point engagement exists therebetween, whereby said engaging part of said material can be fixedly supported by said pin, and then said material together with a pair of finger pieces can be advanced toward said sewing machine, until the front edges of said finger pieces reach a stitching line by means of said sewing machine.

4,120,252

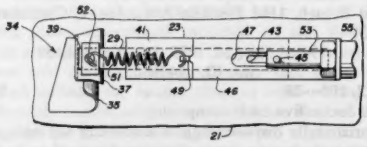
HEMMER ATTACHMENT FOR A SEWING MACHINE

Aaron Glassman, Scranton, Pa., assignor to Pennsylvania Sewing Research Corp., Dunmore, Pa.

Filed Sep. 7, 1977, Ser. No. 831,190

Int. Cl.[2] D05B 35/04

U.S. Cl. 112—143 **7 Claims**



1. A hemmer attachment for a sewing machine comprising guiding walls arranged to fold a margin of a body of material

to form a hem, said walls comprising a stationary outer portion and a movable inner portion mating with said outer portion, and means attached to said inner portion for translating said inner portion away from its mating position with said outer portion and then rotating said inner portion away from its outer portion, characterized in that said translating-and-rotating means comprise

(a) a holder for a sliding member;

(b) a sliding member in said holder, said sliding member comprising (i) a driving part and (ii) a driven part connected in tandem with a pin to said driving part, said inner portion of said walls being attached to said driven member;

(c) connection means attached to said driving part for positioning said sliding member in one of at least two different positions with respect to said holder; whereby, in one position, said pin and a portion of said driven part are inside said holder and, in the other position, said pin and said driven part are outside said holder;

(d) and means for rotating said driven part about said pin when said sliding member is moved from said one position to said other position.

4,120,253

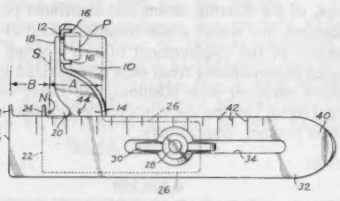
TUBULAR LOOP FORMING TOOL FOR SEWING MACHINES

Thomas O. Blair, 8026 SE. Powell Blvd., Portland, Oreg. 97206

Filed Apr. 15, 1977, Ser. No. 787,859

Int. Cl.[2] D05B *29/00, 35/00*

U.S. Cl. 112—151 **6 Claims**



1. A sewing machine loop forming tool, comprising:

(a) a body having an upper end portion adapted for attachment to the presser bar of a sewing machine,

(b) a foot member on the lower end of the body having a forward portion dimensioned to extend laterally across the longitudinal sewing line of the needle of a sewing machine and a rearward portion having an inner side edge disposed laterally inward of said sewing line, whereby to allow rearward movement of fabric stitched together by the needle of the sewing machine, and

(c) fabric fold gauge means on the forward portion of the foot member having a fabric folding edge located on the side of the sewing line opposite the said inner side edge of the rearward portion of the foot member and extending rearwardly at least substantially to the transverse line of the needle of a sewing machine, for folding fabric extending from under the foot member back over the latter for stitching the lapped portions of fabric together as the fabric progresses rearwardly through the sewing machine.

4,120,254

DIRECT DRIVE FEED SYSTEM FOR SEWING MACHINES

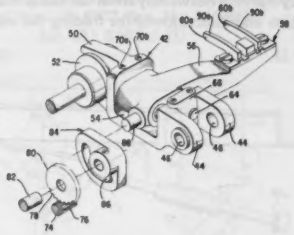
John A. Herr, Garwood, and James A. Transue, Union, both of N.J., assignors to The Singer Company, Elizabeth, N.J.

Filed Sep. 14, 1977, Ser. No. 833,199

Int. Cl.[2] D05B *27/02, 69/10*

U.S. Cl. 112—158 E **8 Claims**

1. In a sewing machine have an endwise reciprocable thread carrying needle supported for penetrating a fabric to form stitches therein, a work feed mechanism including a feed dog for moving fabric across a work surface of said sewing machine, support means for said feed dog including a guide frame mounted on the machine for reciprocation in one plane and a feed dog carrier mounted for linear reciprocation in the guide frame in another plane perpendicular to the plane of reciproca-



tion of the guide frame, and driving means connected to the support means for imparting reciprocatory motion to the guide frame and feed dog carrier in the said one and another plane respectively during operation of the machine, the driving means including a low inertia, permanent magnet rotary electrically reversible motor.

4,120,255

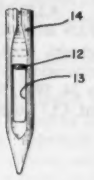
MONOFILAMENT SEWING THREAD

Philippe Hardy-The McLain, Columbia, S.C., assignor to Shakespeare Company, Columbia, S.C.

Continuation-in-part of Ser. No. 720,255, Sep. 3, 1976, abandoned. This application Jul. 25, 1977, Ser. No. 818,518

Int. Cl.[2] D05B *85/00*

U.S. Cl. 112—222 **6 Claims**



1. In combination with a sewing machine needle having a rectangular eye elongated axially thereof, a synthetic monofilament sewing thread of substantially rectangular cross section having a width to thickness ratio of about 3.0:1 to about 4.0:1, said thread adapted to lie flatwise against the inner end of said eye when passing through said eye during a stitching operation.

4,120,256

APPARATUS FOR SEALING FLANGE JOINTS

Joel H. Semler, 9202 Larston, Houston, Tex. 77055

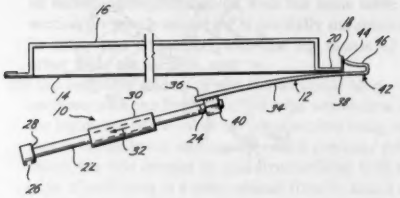
Filed Sep. 6, 1977, Ser. No. 830,849

Int. Cl.[2] B21D *19/00*

U.S. Cl. 113—57 **6 Claims**

1. A flanging tool used in attaching a vehicular door panel to a door frame, that may be used with the door on or off of the vehicle, when combined with an impact tool having a rod with a connecting end and a retaining end, and a weight disposed around the rod and moveable along the rod to provide a force at the connecting end by movement of the weight against a stop shoulder located at the retaining end, comprising a shank of sufficient length to enable said flanging tool to be used on the door panel edge located inside the body cavity when the door is open, having a connecting end and a crimping end;

means attached at the connecting end of said shank for connecting the shank to the connecting end of the rod of the impact tool; and a hook mounted with the crimping end of said shank having a flared end means of sufficient length for initially engaging a flanged edge of the door panel and beginning to fold the edge over a door frame lip; said flared end means generally curving outwardly from the shank side of said crimping portion and dimensioned for folding the edge over the lip;



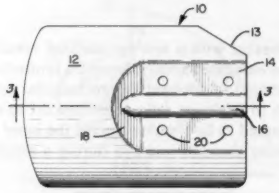
and a crimping portion means of generally U-shaped cross-section with one side of the "U" extending into the shank and the other side of the "U" extending into the flared end means, said crimping portion means being of sufficient length for progressively engaging the door panel edge as the flared end means folds the edge over the door frame lip and to progressively crimp the edge to the lip, the folding and crimping of the edge to the door frame lip being accomplished by movement of the weight against the stop shoulder.

4,120,257

SHEET METAL FAN BLADE FORMING PROCESS

Joseph Victor Matucheski, Indianapolis, Ind., assignor to Wallace Murray Corporation, New York, N.Y.

Filed May 24, 1977, Ser. No. 799,983
Int. Cl.[2] B63B *19/00*
U.S. Cl. 113—116 D **3 Claims**



1. A method of making a curved sheet metal fan blade from a sheet metal workpiece which is to be flattened over a portion thereof for subsequent superposed attachment to a flat mounting arm, including the steps of:

(a) forming a workpiece of generally cylindrical contour and of a desired outline,

(b) stamping a rib on the workpiece, the rib extending from one edge of the workpiece towards another edge of the workpiece,

(c) simultaneously flattening the workpiece by stamping at portions laterally of the rib to thereby form a flat mounting pad, the mounting pad adapted to be attached to a flat spider arm of a fan hub,

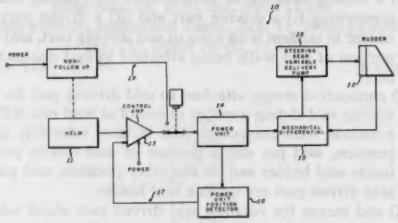
(d) whereby step (c) will not cause departure from the initial workpiece outline.

4,120,258

VARIABLE RATIO HELM

William T. Spurgin, Charlottesville, Va., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Oct. 13, 1976, Ser. No. 731,614
Int. Cl.[2] B63H *25/00*
U.S. Cl. 114—144 E **5 Claims**



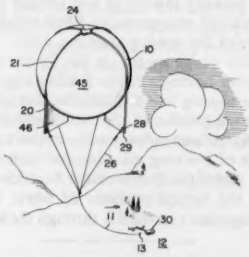
1. An improved variable rate ship's helm for controlling the ship's rudder position, from one hardover position to a second hardover position through rotational displacement of the ship's steering means, from one hardover to another hardover stop position disposed less than 360° about the steering means, wherein the improvement comprises a non-linear potentiometer responsive to the displacement of said steering means and coupled to the ship's rudder, said non-linear potentiometer so constructed and arranged for producing an electrical signal which is linearly related to a first portion of the displacement of said steering means between fixed limits, centered about midships, of the steering means and associated potentiometer displacement, and which is non-linearly related to the remaining portion of the displacement of said steering means and associated potentiometer from each of said fixed limits to said respective hardover stop positions, the linear or non-linear electrical signal varying the ship's rudder position in a linear or non-linear manner, respectively.

4,120,259

VISUAL AND RADAR EMERGENCY DETECTION BALLOON

Gene W. Wilson, Enterprise, Oreg., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Feb. 23, 1977, Ser. No. 771,079
Int. Cl.[2] G08B *21/00*; H01Q *15/18*
U.S. Cl. 116—124 B **1 Claim**



1. A balloon which may be tethered by a flexible cord to provide a visual and a radar target to signal an emergency situation at a site from which the balloon is tethered, in which said balloon is fitted with radar and light reflecting projecting cards that extend away from the balloon to increase the area of reflectivity of the balloon and sheets to light and radar rays, comprising

a balloon inflated with a gas such as helium so as to cause it to rise in air,

an elastic strap means fitted over the top of the balloon

which expands so as to permit the circumference of the balloon to expand as the balloon expands in flight, said strap means formed of a plurality of leg section, each said leg section being joised to a common cross-piece above the top of the balloon, with each strap leg section extending from the cross-piece and about the top section of the balloon to join to individual cards of said projecting cards,

the individual cards flat and extending below the lower section of the balloon, with each flat card fastened to an individual tie cord, with all said tie cords tied together below the balloon at a common point to the common tether cord so as to retain each said card abutting a lower quadrant of the balloon, with

each said card extending in a substantially vertical plane below the balloon in a radial plane relative to the balloon, said cards aligned by the elastic strap and the tie cords so that at least two such cards extend in substantially mutually perpendicular vertical planes, in which the

external surface of said balloon and each said card is coated with a layer of light and radar reflective material, and in which the cards serve to extend the plane of visual and radar reflection area of the balloon.

4,120,260
APPARATUS FOR APPLYING REFRACTORY MATERIAL ONTO THE INNER SURFACE OF A FURNACE

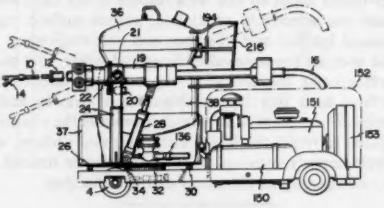
Sueki Kubo; Toshiro Watanabe; Masayuki Fujita; Tadahiko Matsuno, all of Kitakyushu, and Akira Morita, Ibaragi, all of Japan, assignors to Kurosaki Refractories Co., Ltd., Fukuoka, Japan

Filed Apr. 19, 1977, Ser. No. 788,941

Claims priority, application Japan, Apr. 19, 1976, 51/44759; Nov. 12, 1976, 51/136733; Nov. 16, 1976, 51/154018[U]; Nov. 24, 1976, 51/141422; Dec. 1, 1976, 51/161518[U]; Dec. 3, 1976, 51/145757; Dec. 3, 1976, 51/162941; Dec. 8, 1976, 51-148048; Dec. 23, 1976, 51-173401; Jan. 20, 1977, 52-6182; Feb. 7, 1977, 52-12679; Feb. 15, 1977, 52-17727; Mar. 28, 1977, 52-38147

Int. Cl.[2] B05B *13/06*

U.S. Cl. 118—317 **28 Claims**



1. An apparatus for applying a refractory material onto the inner surface of a furnace comprising in combination:

a mobile transport car;

a rotatable turntable mounted on said transport car;

a spray pipe having a spray nozzle at one end thereof for spraying refractory material onto the inner surface of a furnace and adapted to receive the refractory material from a supply of the refractory material adjacent the other end thereof, said spray pipe comprising inner and outer pipes;

support means positioned on said rotatably turntable rotatably and pivotably supporting said spray pipe;

storage means mounted on said rotatable turntable for storing at least a supply of refractory material therein, said storage means including a first tank for the storage of refractory material and a second tank for the storage of water which is concentrically disposed relative to said refractory material storage tank, and

means carried by said transport car for supplying the refractory material to said spray pipe from said storage means and for propelling the refractory material through said spray pipe and spray nozzle.

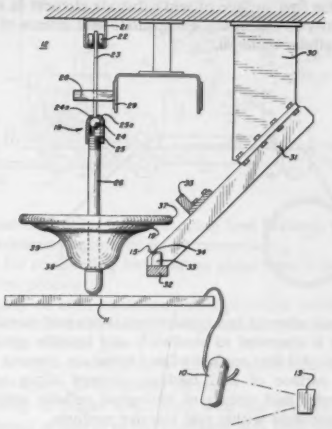
4,120,261
ELECTROSTATIC COATING SYSTEM

Joseph C. Hafele; Thomas J. Richards, and Paul L. Wright, all of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 25, 1977, Ser. No. 855,060

Int. Cl.[2] B05B *5/02*

U.S. Cl. 118—630 **12 Claims**



1. In a coating system in which a workpiece at a high electrostatic potential is moved by conveyor through a coating zone, an improved workpiece charging system comprising:

a workpiece support to move the workpiece through the coating zone and having a swivel joint therein;

a conductor extending through the coating zone adjacent the path of said support;

a source of DC potential connected with said conductor to establish a charging field; and

a charge collector on said support having a spherically contoured surface with a convex face presented to said charged conductor, said spherically contoured surface swinging from said swivel joint with the spacing of said charge collector surface from said charged conductor substantially constant.

4,120,262
APPARATUS FOR TRANSFERRING A PLURALITY OF SMEARS

Stanford L. Adler, Monsey, N.Y., and Abraham Gordon, Teaneck, N.J., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 642,421, Dec. 19, 1975, abandoned. This application Jun. 15, 1977, Ser. No. 806,640

Int. Cl.[2] B05C *1/02*

U.S. Cl. 118—642 **7 Claims**

1. Transfer apparatus for transferring a plurality of discrete biological cellular smears of blood from a substrate to a backing element, comprising:

(a) substrate element having a first surface,

(b) a plurality of smears of biological cellular material,

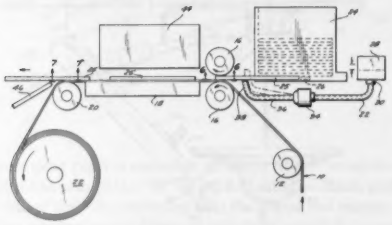
(c) said biological cellular smears being positioned on said first surface of said substrate element in spaced relationship,

(d) means adapted and constructed to move said substrate element along a predetermined path,

(e) a plurality of backing elements each having a first surface,

(f) supply means for said backing elements,

(g) means adapted and constructed to move said backing element in proximity to said path and in opposing surface relationship with said first surface of said substrate element,
(h) transfer medium,
(i) said transfer medium being transparent and exhibiting a refractive index substantially that of said smear of biological cellular material,
(j) means adapted and constructed when said transfer apparatus is operated to introduce along said path said transfer medium between the first surface of said backing element and the first surface of said substrate element in sufficient quantity to essentially encapsulate said smears of biological cellular material,

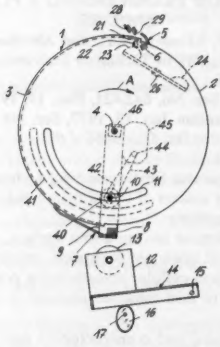


(k) means adapted and constructed when said transfer apparatus is operated to sandwich said transfer medium between said first surface of said substrate element and said first surface of said backing element along said path whereby said smears of biological cellular material are encapsulated within said transfer medium,
(l) means adapted and constructed when said transfer apparatus is operated to part said backing element from said substrate element along said path,
(m) said transfer medium having sufficient adhesive properties whereby said transfer medium is selectively adhered to said first surface of said backing element and said smears of biological cellular matrial adhere to said transfer medium when said transfer apparatus is operated.

4,120,263
MATRIX SUPPORTING DEVICES IN ELECTROSTATIC DEVELOPMENT APPARATUS

Vittorino Boschet, Milan, Italy, assignor to Grafosol S.p.A., Milan, Italy

Filed Feb. 18, 1977, Ser. No. 769,866
Claims priority, application Italy, Feb. 26, 1976, 20602 A/76
Int. Cl.[2] G03G *15/09*
U.S. Cl. 118—657 **3 Claims**

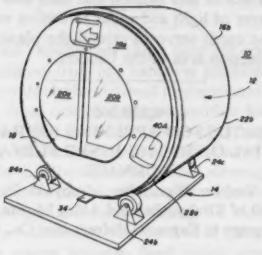


1. Improvements in matrix supporting devices for use in electrostatic development apparatus having a cylindrical surface to which a matrix sheet is to adhere, pliers for retaining a rear portion of the matrix sheet, a magnetic cylinder or roller, and associated toner containing tray, said improvements comprising:
means for moving said pliers along said cylindrical surface; and
carrying means supporting said magnetic cylinder or roller and associated toner containing tray, such that said cylinder or roller and said tray are moved away from said cylindrical surface to allow passage of said pliers.

4,120,264
SANITARY FACILITY FOR PETS

Joseph M. Carter, 11750 W. Belfort, Apt. 1307, Stafford, Tex. 77477

Filed May 11, 1977, Ser. No. 796,034
Int. Cl.[2] A01K *29/00*
U.S. Cl. 119—1 **7 Claims**



1. A device for selectively removing small animal feces and agglomerated waste matter from soiled pet litter comprising:
a rotatable chamber adapted to contain said litter, the wall of said chamber having at least one opening suitable for animal ingress and egress, and a second opening substantially coincident with the axis of rotation for removal of said feces and waste;
a base to moveably support the chamber for rotational movement about an axis with respect to the base; and,
at least one selectively restrictive, porous surface, rigidly situated interior said chamber and communicating with said opening for removal of feces and waste, said porous surface being inclined with respect to the interior drum surface, such that the combination of gravity and the selectively restrictive surface cooperate as the chamber is rotated to retain the waste matter on said surface, while simultaneously moving the retained matter toward said second opening to ultimately exit the chamber.

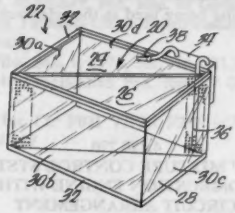
4,120,265
AQUARIUM DIVIDER

Thomas E. Davis, 666 Amber La., Apt. 101, Carol Stream, Ill. 60187

Filed Nov. 18, 1976, Ser. No. 742,868
Int. Cl.[2] A01K *64/00*
U.S. Cl. 119—5 **2 Claims**

1. In an aquarium tank having a bottom and four side walls, a clear, transparent, diagonal divider physically dividing the tank into two compartments while maintaining the visual impression of a single compartment aquarium, said divider being vertical, resting on the bottom of the aquarium and being of a height slightly greater than the level of the water in the aquarium, said divider being clear, imperforate and transparent throughout the major portion of the area thereof and including perforate areas adjacent and along its two ends for passage of water back and forth between the two compartments into which the aquarium is divided, and resilient mounting members at the two ends of said divider for fitting the same snugly into diagonally opposite corners of the aquarium into which

the divider extends, and including small slots along the top of the divider just below the level of the water in the aquarium for



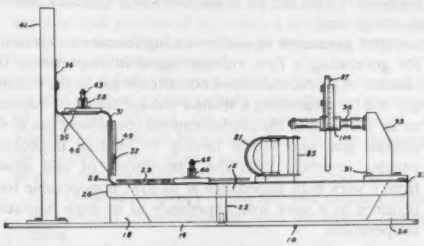
circulation therethrough of surface water, the remainder of said divider, except for adjacent said two ends, being imperforate.

4,120,266

SUBHUMAN PRIMATE RESTRAINT SYSTEM

Clarence M. Oloff, Montgomery County; Alva A. Karl, Dayton; Walter M. Wolff, Enon; Lloyd W. Halbrook, Dayton, all of Ohio; Ray D. Brown, Galveston, Tex., and Raymond G. Dickey, Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 23, 1976, Ser. No. 753,959
Int. Cl.[2] A61D *3/00*
U.S. Cl. 119—103 **6 Claims**



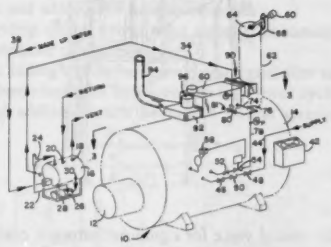
1. A restraint assembly for subhuman primate, comprising: a rigid frame member; said frame member including a pair of plate members attachable to a platform which may be secured to a centrifuge; said frame member including a body support plate member and an adjustable seat and leg support member; means for securing the body of a subhuman primate to the body support plate; lower arm restraint means for securing the arms of said subhuman primate to the body support plate member; lower leg restraint means for securing the legs of said subhuman primate to said seat and leg support member; upper leg restraint means secured to said seat and leg support member for preventing removal of the legs of the subhuman primate from said lower leg restraint means; upper arm restraint means secured to said body support member for preventing removal of the arms of the subhuman primate from the lower arm restraint means; means attached to said frame member for holding the head and neck of the subhuman primate against the body support member; said head and neck holding means including slidable means for permitting movement of the head and neck of the subhuman primate.

4,120,267

TUBE AND PLATE HEAT EXCHANGER

Michael J. Wood, 9431 Lotus Dr., Westminster, Calif. 92683

Filed Jan. 21, 1977, Ser. No. 761,331
Int. Cl.[2] F22D *1/08*; F28F *1/30*
U.S. Cl. 122—20 B **12 Claims**



1. A heat exchanger for exchanging heat between a gas and a liquid wherein the improvement comprises:

a duct for conducting hot exhaust gases from a prior combustion process;

a plurality of interconnected tubes provided with an inlet and an outlet and passing through said duct to receive heat from the exhaust gases;

means to connect said tubes at the inlet and outlet thereof to a fluid that is to be heated therein;

a plurality of plates in contact with the respective tubes implaced in said duct for receiving heat from the exhaust gases passing thereover;

fan means connected to said duct to draw exhaust gases in the direction of said fan means across the plates and tubes, thereby diminishing the restriction of gas flow caused by said plates and tubes;

a damper within said duct for regulating the flow of gases through said duct over said plates and tubes of the heat exchanger; and,

means to control said damper comprising at least in part a differential pressure detector for detecting differences in pressure between the upstream and downstream points within said duct for accordingly adjusting the position of said damper.

4,120,268

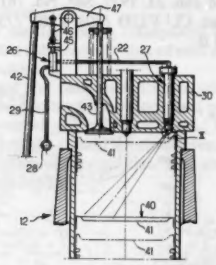
DEVICE FOR INJECTING WATER INTO THE CYLINDERS OF AN INTERNAL COMBUSTION ENGINE, PARTICULARLY FOR REDUCING THE DEGREE OF POLLUTION OF THE LATTER

Dirk Bastenhof, Eaubonne, France, assignor to Societe d'Etudes de Machines Thermiques-S.E.M.T., Saint Denis, France

Filed May 24, 1977, Ser. No. 799,930
Claims priority, application France, Jul. 2, 1976, 76 20383
Int. Cl.[2] F02D *19/00*
U.S. Cl. 123—25 C **4 Claims**

1. In an internal combustion engine having at least one cylinder, a piston reciprocable in the cylinder, at intake valve for the cylinder, means for actuating the intake valve to open during each intake stage of the combustion cycle in the cylinder for admitting combustion air into the cylinder and to shut at approximately the beginning of each compression stage of the combustion cycle, a device for injecting a predetermined amount of water into the cylinder, and means for actuating the water injection device during a predetermined portion of the combustion cycle in the cylinder, the improvement wherein the means for actuating the water injection device is operatively coupled to the means for actuating the intake valve for actuating the water injection device to inject said predetermined amount of water in synchronization with the shutting of the intake valve at the beginning of the compression stage of

the combustion cycle in the cylinder, the predetermined amount of water maintaining the temperature in the cylinder



below the critical value for significant nitrogen oxide production, with consequent reduction of pollution from the engine.

4,120,269

COMPENSATION FOR INHERENT FLUCTUATION IN OUTPUT LEVEL OF EXHAUST SENSOR IN AIR-FUEL RATIO CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

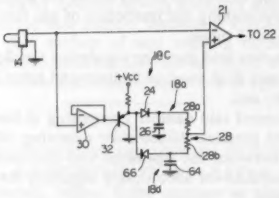
Takeshi Fujishiro, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 19, 1976, Ser. No. 715,652

Claims priority, application Japan, Sep. 30, 1975, 50-117244; Dec. 13, 1975, 50-167488[U]

Int. Cl.² F02B *3/00*

U.S. Cl. 123—32 EE **8 Claims**



1. In a feedback control system for maintaining the airfuel ratio of a combustion mixture feed to an internal combustion engine, the system including an exhaust sensor which is installed in the exhaust line of the engine and produces an output voltage representing the concentration of a definite component of the exhaust gas of the engine, the concentration being in dependence on the airfuel ratio of the combustible mixture consumed in the engine, a comparison circuit to detect the magnitude of a deviation of the output voltage of the exhaust sensor from a reference voltage and a control circuit to control the function of the air-fuel proportioning device based upon the detected magnitude of the deviation, a circuit for producing the reference signal comprising:

a first capacitor connected to the exhaust sensor to continuously receive the output voltage of the exhaust sensor, and a voltage divider connected in parallel with said first capacitor, said voltage divider being adjusted such that the output voltage of said voltage divider is continuously below and in a definite proportion to the maximal value of the output voltage of said exhaust sensor; and

a second capacitor connected in parallel with said first capacitor to interpose said voltage divider, a first diode through which the output voltage of the exhaust sensors is applied to the said first capacitor and said voltage divider and a second diode with the anode thereof connected to said second capacitor and the cathode thereof connected to the anode of said first diode, said voltage divider being adjusted such that the output voltage of said voltage divider is continuously in a definite proportion to the mean value of maximal and minimal values of the output voltage of the exhaust sensor, said output voltagge of said voltage divider being used as the reference voltage.

4,120,270

CLOSED-LOOP MIXTURE CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE WITH FAIL-SAFE CIRCUIT ARRANGEMENT

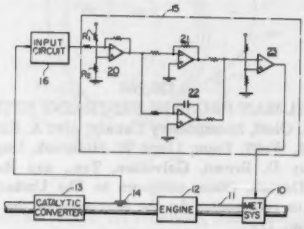
Masaharu Asano, Yokohama, and Makoto Anzai, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 2, 1976, Ser. No. 692,193

Claims priority, application Japan, Jun. 3, 1975, 50-74368[U]

Int. Cl.² F02B *3/00*

U.S. Cl. 123—32 EE **10 Claims**



1. A closed-loop mixture control system for an internal combustion engine including means for supplying air and fuel thereto in variable ratio and means for adjusting said air and fuel supplied to said engine in response to a feedback control signal, comprising:

an exhaust gas sensor operable at a high sensor temperature for generating a first voltage signal in response to the absence of a predetermined constituent gas in the exhaust gas and for generating a second voltage signal in response to the presence of the predetermined constituent gas in the exhaust gas, said sensor having an internal impedance varying inversely with the temperature of said sensor from a very high impedance at its low, nonoperable temperature to a very low impedance at its high operating temperature;

an input impedance circuit means connected to one terminal of said sensor, a second terminal of the sensor being connected to a reference potential, said circuit means connected to said sensor terminals and having an impedance value intermediate said very high and very low internal impedances of said sensor so that when the internal impedance of the said sensor is either at said very high or very low level, said input impedance circuit means develops a potential substantially equal to said reference potential; and

an exhaust gas sensor amplifier circuit connected to said input impedance circuit means, the output signal of said amplifier circuit having a first voltage level in response to the internal impedance of said sensor being either very high or very low, said amplifier circuit being adapted to switch between said first voltage level and a second voltage level in response to said first and second voltage signals from said sensor, the output of said amplifier circuit being a feedback control signal which causes said air fuel adjusting means to enrich said supplied air-fuel mixture when the internal impedance of said sensor is very high or very low.

4,120,271
VENTILATING ARRANGEMENT FOR AN ENGINE COMPARTMENT

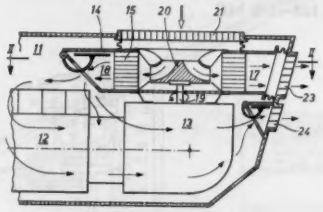
Franz Edmaier, Markdorf, Fed. Rep. of Germany, assignor to Motoren- und Turbinen-Union Friedrichshafen GmbH, Fed. Rep. of Germany

Filed Sep. 9, 1976, Ser. No. 721,753

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1975, 2540040

Int. Cl.² F01P *11/10*; F28F *9/22*

U.S. Cl. 123—41.49 **5 Claims**



1. Ventilating and cooling arrangement for an engine compartment of a liquid-cooled internal combustion engine of the type having a radiator for recooling the engine coolant by means of ambient air; said arrangement comprising:

ambient air moving means for drawing air through said radiator,

and an air conducting housing separate from the engine compartment and surrounding the radiator,

wherein said air conducting housing is configured to form two radiator exhaust air chambers at respective different positions adjacent said radiator, one of said radiator exhaust air chambers communicating a first portion of the exhaust air from said radiator to the engine compartment as engine compartment cooling and ventilation air, the other of said radiator exhaust air chambers communicating a second portion of the exhaust air from said radiator to the surrounding atmosphere in bypassing relationship to said engine compartment,

wherein said radiator is a ring radiator having a central inlet for said ambient air and radially extending outlets for said air disposed around the circumference thereof, and wherein said ambient air moving means is a fan disposed in the central portion of said radiator, and

wherein between one-third (1/3) and one-half (1/2) of the ring radiator periphery opens into said radiator exhaust air chamber communicating with the engine compartment.

4,120,272
DEVICE FOR OPTIMUM CONTROL OF THE SPARKING TIME OF A SPARK IGNITION ENGINE, DURING ITS OPERATION

Andre Dousaud, Puteaux, and Joseph Rialan, Meudon, both of Francé, assignors to Institut Francais du Petrole, France

Filed Dec. 21, 1976, Ser. No. 752,852

Claims priority, application France, Dec. 30, 1975, 75 40081

Int. Cl.² F02P *5/14, 3/08*

U.S. Cl. 123—117 D **19 Claims**

1. An automatic device for optimum control of the spark advance point in a spark ignition circuit of an engine, comprising

means for detecting the occurrence of knocking during the combustion, said detecting means being responsive to the vibration of the engine exclusively during a fraction of the combustion phase corresponding to a selected angular interval of rotation of the crankshaft,

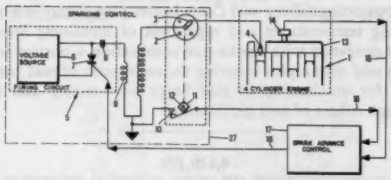
adjustment means actuated by said detection means and connected to the ignition circuit, said adjustment means applying a time-delay to the ignition circuit upon detection of a selected number of knock-containing power cycles,

and means for following the rotation of the crankshaft and producing successive electric pulses corresponding to consecutive angular positions of the crankshaft in order to define said angular interval during which said detecting means is responsive to the engine vibrations,

wherein said adjustment means comprises

a first adding circuit delivering a signal after summing up a fixed number of power cycles,

a second adding circuit for delivering a signal after summing up a fixed number of knock-containing power cycles, each of said adding circuits having an output terminal connected to terminals for simultaneously resetting both adding circuits,



electric up- and downcounting means connected to both of said adding circuits for delivering a spark advance control signal defining an angular correction for the spark advance having a range with preselected limit values and dependent on the difference of the respective numbers of signals delivered by said first and second adding circuits, and

control means, connected to said up- and downcounting means and to said means following the rotation of the crankshaft for controlling the spark advance in said spark ignition circuit.

4,120,273
STARTING AID FOR INTERNAL COMBUSTION ENGINES

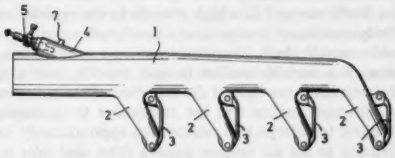
Walter Krause, Rösrath-Stümpen; Peter Bober, Cologne, and Eckhard Haas, Porz-Ensen, all of Fed. Rep. of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Apr. 21, 1976, Ser. No. 678,888

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1975, 2518156

Int. Cl.² F02M *7/00*; F02B *3/00*

U.S. Cl. 123—122 G **11 Claims**



1. For use in preheating combustion air compressed with an internal combustion injection engine without a carburetor, a starting aid which includes in combination: a straight air intake pipe leading to at least one branch pipe to a combustion cylinder, for conveying air to said engine, said air intake pipe being provided with an outwardly bulging section in a straight wall upstream of the air flow to said branch to form a chamber opening into the air intake pipe, at least one flame heater plug extending from the outside of the upstream end of said bulging section into the interior of said upstream end of said outwardly bulging section of said air intake pipe and disposed entirely

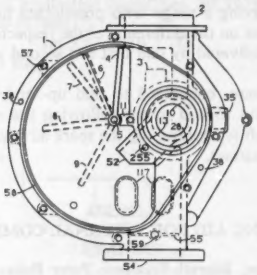
within said chamber for preheating the entire air flow in said air intake pipe to a very high temperature at a value still below that for self ignition of a fuel mixture which is to be avoided, said bulging section being largest in cross section at its upstream end and tapering in the direction of air flow to a smaller cross section at its downstream end, so that the heated air from said flame heater plug will enter directly into said air intake pipe, and an apertured plate with a plurality of apertures throughout its length placed in the opening where said bulging section bulges out from said air intake pipe to separate said chamber from the air flow in the adjacent portion of said air intake pipe so the air flow does not interfere with the action of the flame heater plug and to maintain a reduced temperature while permitting communication therebetween through the apertures of said apertured plate to assure preheating stability without extinguishing said flame heater plug regardless of low starting temperatures and regardless of increasing speed to attain operation with smoke-free combustion, a portion of said air in said intake pipe entering through some of said perforations for combustion in said bulge and exiting said bulge through others of said perforations.

4,120,274

CARBURETORS OR FUEL MIXING SYSTEMS

Warren H. De Lancey, 1580 Prospect Ave., Apt. H-4, Elyria, Ohio 44035

Filed Jun. 5, 1975, Ser. No. 584,203
Int. Cl.[2] F02M *69/00*
U.S. Cl. 123—139 E **19 Claims**



1. A carburetor for supplying a continuous mixture of air and finely divided fuel particles to an internal combustion engine having a fuel volume control comprising:

(a) a main body having an air inlet and a mixture outlet, a closed conduit connecting said inlet and outlet, and a valve in said outlet controlled by linkage to the engine's fuel volume control;

(b) a shaft, one end of which extends to the exterior of said body enclosure, a vane in said conduit fixed to and rotatable on said shaft, the position of said vane defining the size of a variable orifice in said conduit, and a spring biasing said vane against the direction of air movement to a minimum orifice size but responsive to increasing air volume to enlarge said orifice area approximately in proportion to the air volume passing from said inlet to said outlet;

(c) a variable capacity rotary metering pump for measuring fuel volume, a constant speed electric motor driving said pump, said pump housed in said main body enclosure and having its inlet connected to a pressurized fuel supply, and its discharge mixing with the metered air, and a modulating shaft for modulating the output of said pump, said modulating shaft extending to the exterior of said body enclosure;

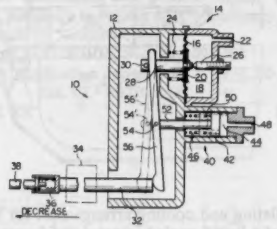
(d) a mechanical linkage connected between said vane and said modulating shaft whereby said vane supplies the energy and movement to position said modulating shaft and maintain the air-fuel ratio within predetermined limits regardless of air volume.

4,120,275

ENGINE FUEL INJECTION PUMP GOVERNOR

Hiroshi Isobe; Toru Koyanagi, and Toru Sakuranaka, all of Higashi Matsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jun. 25, 1976, Ser. No. 699,788
Claims priority, application Japan, Jun. 28, 1975, 50/90815[U]; Jun. 28, 1975, 50/90816[U]
Int. Cl.[2] F02D *1/04*
U.S. Cl. 123—140 MC **5 Claims**



1. An engine fuel injection pump governor comprising in combination:

a fuel injection control member movable from a maximum fuel injection position in a fuel injection decreasing direction;

biasing means urging the control member toward the maximum fuel injection position;

an engine induction air pressure sensor;

a linkage connecting the air pressure sensor to the control member in such a manner that the control member is moved thereby in a fuel injection increasing direction as a magnitude of sensed induction air pressure increases;

an engine oil pressure sensor connected to the linkage in such a manner that the control member is moved thereby to the maximum fuel injection position when a sensed engine oil pressure is substantially zero and is moved thereby in the fuel injection decreasing direction as the engine oil pressure increases;

an engine speed sensor for moving the control member toward the maximum fuel injection position as a sensed engine speed decreases below a predetermined value; and

releasing means for allowing the control member to be moved by the speed sensor against the action of the air pressure sensor;

said air pressure sensor comprising a rod movable in response to sensed induction air pressure, the oil pressure sensor comprising a rod movable in response to sensed oil pressure and the linkage comprising a lever pivotally supported at an intermediate point thereof by the rod of the oil pressure sensor and pivotally engageable at its opposite end portions with the rod of the air pressure sensor and with the control member respectively.

4,120,276

GUN WITH INTERMEDIATE SUPPORT FOR BARREL THEREOF

Roger Curran, Stratford, Conn., assignor to Bangor Punta Operations, Inc., Greenwich, Conn.

Filed Feb. 4, 1977, Ser. No. 765,554
Int. Cl.[2] F41F *17/06*; F41B *11/06*
U.S. Cl. 124—85 **16 Claims**

1. A gun comprising:

a gun frame;

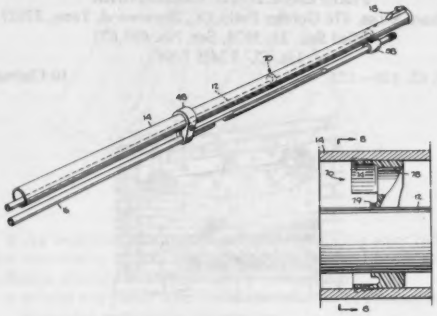
a gun barrel shroud;

means carried by said frame for supporting an end portion of said barrel shroud;

a gun barrel within said barrel shroud and spaced radially therefrom;

means carried by said frame for supporting an end portion of said barrel;

means coupling the opposite end portion of said barrel and the opposite end portion of said barrel shroud one to the other for supporting said opposite barrel end within said shroud;



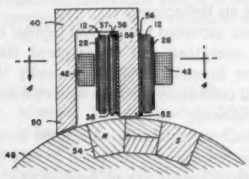
means disposed within said shroud intermediate the opposite end portions thereof for supporting the gun barrel at a location intermediate the barrel support means at the opposite ends of said barrel thereby maintaining the barrel substantially straight throughout its length, and said intermediate supporting means having a through opening for receiving the gun barrel, said intermediate supporting means having attached thereto outer margins for bearing against the inside wall surface of the shroud, said margins flaring outwardly from and extending from said intermediate supporting means in axial and radial directions.

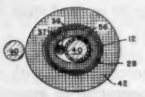
4,120,277

BREAKERLESS MAGNETO DEVICE

Jack W. Ehlen, Torrance, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.

Filed Apr. 25, 1977, Ser. No. 790,704
Int. Cl.[2] F02P *1/00*
U.S. Cl. 123—148 CC **13 Claims**





1. A magneto ignition system for use with an internal combustion engine, comprising:

a first core,

a first winding mounted on said first core,

means for completing a circuit through said first winding,

a second core positioned inside said first winding next adjacent and spaced from said first core,

a trigger winding mounted on said second core,

a rotor having a permanent magnet for producing varying flux through said first and second cores to induce voltages across the respective first winding and trigger winding, and

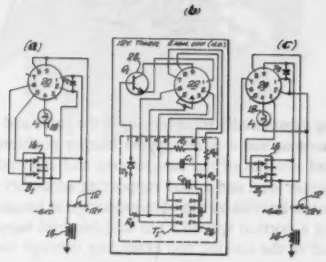
means responsive to the voltage generated in said trigger winding for selectively interrupting the flow of current through said circuit means.

4,120,278

AUTOMATIC SHUT-DOWN CONTROL SYSTEM FOR TRUCK DIESEL ENGINES EQUIPPED WITH EXHAUST-DRIVEN SUPERCHARGERS

Gaylan J. Ward, 2626 Chico Ave., S. El Monte, Calif. 91733

Filed Sep. 17, 1976, Ser. No. 724,268
Int. Cl.[2] F02B *77/00*
U.S. Cl. 123—198 D **4 Claims**



1. A controller for the automatic performance of predetermined operating modes prior to the shut down of automotive diesel engines equipped with exhaust-turbine superchargers, said controller comprising:

integrated circuit means wired as a time-lapse mechanism,

an initiating circuit connected to said integrated circuit means for starting the time-lapse operation thereof,

switching means connected to the electrical circuit of the diesel engine; and a momentary switch connected to said initiating circuit, whereby said initiating circuit induces said integrated circuit means to provide an output signal for a predetermined period of time, and whereby said output signal operates said switching means to provide current derived from the electrical circuit of said diesel engine to ensure the operation of the engine at a predetermined speed regime for said predetermined period of time, wherein said integrated circuit means include a plurality of integrated circuit devices, each adapted to provide a particular output signal for a predetermined time, and wherein said switching means include a plurality of switching elements, each operated by one of said output signals, for the provision of a plurality of sequential current to the integral controls of the engine, to ensure the operation of said engine for said plurality of predetermined periods of time, each at a predetermined speed require.

4,120,279

BARBECUE PIT HANGER

Von M. White, 474 3rd Ave., Salt Lake City, Utah 84103

Filed Oct. 14, 1976, Ser. No. 732,364
Int. Cl.[2] F24B *3/00*; A47J *33/00*
U.S. Cl. 126—30 **5 Claims**

1. A barbecue pit hanger comprising

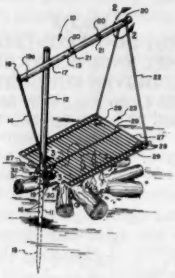
a stake having a plurality of holes therein, said holes being spaced along the length of said stake;

an upper sleeve having a lower end adapted to telescope over an upper end of the stake;

a hanger arm pivotally connected intermediate its length to an upper end of the upper sleeve, said hanger arm having

a hole through one end thereof, and at least one notch formed in a top surface thereof adjacent the other end of the arm; and

a locking rod having one end bent to extend through the hole in the hanger bar and the other end bent to extend through a hole in the stake when the hanger bar is extending substantially transversely to the stake and upper sleeve thereon; and a wire support hanger positioned in one of said notches of the hanger arm and suspended from the hanger arm; and a food supporting accessory supported at one of its ends by the wire supported at hanger and including a portion spaced from said one end supported by the end of the locking rod extending through the stake.



4,120,280

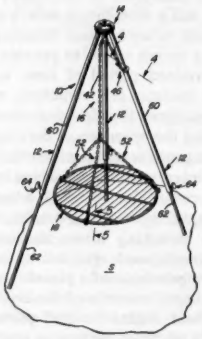
ADJUSTABLE GRILL DEVICE

Harold L. Iverson, 1 Live Oak La., Fort Myers, Fla. 33905, and Robert M. Lemley, Fort Myers, Fla., assignors to Harold L. Iverson, Fort Myers, Fla., a part interest

Filed Mar. 14, 1977, Ser. No. 777,570

Int. Cl.[2] A47J *33/00*; F16M *11/00*; F24B *3/00*

U.S. Cl. 126—30 **11 Claims**



1. An adjustable grill device, comprising, in combination:

(a) at least three coextensively arranged legs;

(b) head means connected to the legs for disposing the legs in coextensive and adjustable relationship with respect to one another; and

(c) support means mounted on the head means for suspending a cooking utensil beneath the head means, the head means including, in combination:

(1) first and second substantially parallel, planar plates spaced from one another and provided with a plurality of matching holes, the number of holes being the same as the number of the legs, the legs being disposed in the holes for adjustment relative to the planes of the plates; and

(2) retaining means disposed between the plates and engaging the legs for holding the legs in the holes provided in the plates.

4,120,281

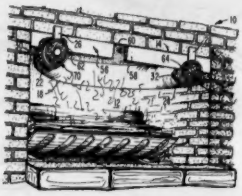
FIREPLACE HEAT EXCHANGER

Richard Wass, 376 Gorden Petty Ct., Brentwood, Tenn. 37027

Filed Sep. 22, 1975, Ser. No. 615,671

Int. Cl.[2] F24B *7/04*

U.S. Cl. 126—121 **10 Claims**



1. A heat exchanger for a fireplace comprising:

(a) a flexible tubular body with expanded interior and expanded exterior heating surfaces, said tubular body forming an elongated passage of generally circular cross section and having inlet and outlet ports at opposite ends, said tubular body having annular ribs defining said expanded interior heating surface which bounds said elongated passage and said expanded exterior heating surface on the outer periphery of said tubular body;

(b) clamp means mounted to each end of said tubular body and configured to be clamped to a lintel of the fireplace for securing said tubular body by its ends only to the lintel of the fireplace in a substantially horizontal plane, said tubular body having a substantially U-shaped profile when mounted to the lintel, said tubular body sufficiently flexible to be readily bent into said U-shaped configuration and sufficiently rigid to be self-supporting in said substantially horizontal plane when only its ends are mounted to the lintel by said clamp means;

(c) a cap mounted to each end of said tubular body and defining air deflectors;

(d) a blower mounted within said tubular body, said blower having energized and deenergized states, said blower operative to make air flow inwardly through said inlet port and outwardly through said outlet port when in said energized state;

(e) a controller electrically connected to said blower; and

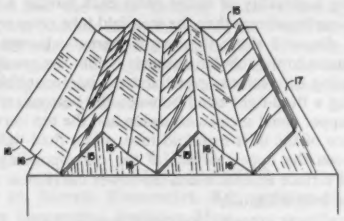
(f) a temperature sensor mounted to said tubular body, said temperature sensor having opened and closed states, said temperature sensor actuated into its closed state on a temperature rise in the range of 100° to 140° F. and is deactuated into its opened state on a temperature drop in the range of 80° to 120° F.;

(g) said blower, said controller and said temperature sensor electrically interconnected with one another, said temperature sensor operative to energize said blower when in said closed state, said temperature sensor operative to deenergize said blower when in said opened state, said controller operative to regulate the speed of said blower when said temperature sensor is in said closed state, said expanded exterior heating surface providing increased heat transfer between heated air in said fireplace and said tubular body, said expanded interior heating surface providing increased heat transfer between said tubular body and said air flowing in said tubular body.

4,120,282
SOLAR RADIATION REFLECTOR AND COLLECTOR ARRAY

Patrick N. Espy, 10,008 Hickory Hill La. SE., Huntsville, Ala. 35803

Filed Apr. 28, 1977, Ser. No. 791,731
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—270 6 Claims



1. An improved non-tracking and concentrating solar radiation conversion system for collecting diffuse and beam solar radiation directly and by reflection comprising:

a. at least one planar solar radiation collector of substantially elongated rectangular dimensions;

b. said collector having long axes arrayed in an approximate east-west direction with planar surfaces tilted downwardly toward the equator at an angle from the horizontal approximately equal to the latitude of the array plus 23.5°;

c. a reflector system having one reflector aperture of substantially elongated rectangular dimensions for each of said collectors;

d. said reflector apertures having long axes parallel with the long axes of said solar radiation collectors with aperture planes tilted downwardly from the equator at an angle from the horizontal equal to 66.5° minus the latitude of the array;

e. said reflector apertures being alternately spaced in a north-south direction with said solar radiation collectors;

f. the upper edge of each of said reflector apertures being joined with the upper end of the adjacent solar radiation collector and the lower edges of each of said reflector apertures being joined with the lower edges of the next adjacent solar radiation collector;

g. said reflector apertures comprising at least one planar reflector facet having a highly light reflective surface sufficient to reflect all noon-time sun rays incident upon the reflector aperture to said solar radiation collector.

4,120,283
SOLAR HEAT COLLECTOR

Anton Allen Eder, Moscow, Id., assignor to Idaho Research Foundation, Inc., Moscow, Id.

Continuation-in-part of Ser. No. 678,126, Apr. 19, 1976, abandoned. This application May 26, 1977, Ser. No. 800,723
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—270 8 Claims

1. In a solar heat collector;

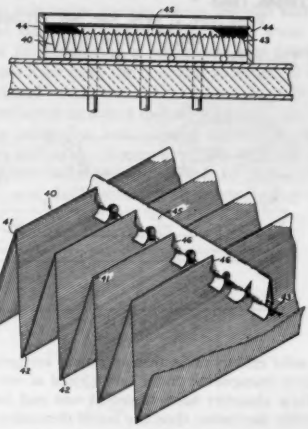
a support frame having transverse width and longitudinal length, the front of the frame being adapted to be faced toward the sun and the back of the frame being adapted to be faced away from the sun;

said frame being in the form of an enclosure having transversely spaced side members and longitudinally spaced end members enclosing an area of solar heat collection;

a plurality of taut flexible support lines stretching between opposed members of the frame, lines being parallel to one another and located in a common plane within the enclosure;

a folded sheet of lightweight flexible material capable of absorbing solar energy, such as a sheet of metallic foil;

said folded sheet being expanded accordion style within the frame to form a series of pleats which present parallel raised peaks and depressed valleys facing toward the front of the frame;

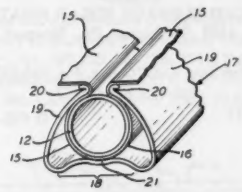


the folded sheet being suspended upon said lines for structural support of the sheet.

4,120,284
CLIP FOR CLINCHING A HEAT EXCHANGE CONDUIT WITH A SOLAR HEAT ABSORBER

John L. Cotsworth, 11 Lake Rd., Short Hills, N.J. 07078, and Daniel F. Ilich, 149-44 Cherry Ave., Flushing, N.Y. 11355

Filed Apr. 14, 1977, Ser. No. 787,386
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—270 4 Claims



1. A clip for clinching a heat exchange conduit with a solar heat absorber comprising:

(a) a generally C-shaped, resilient member having a central portion and outer portions,

(b) the outer portions being externally convex, and deflectable, and defining arms for clinching an object therebetween,

(c) an arch on the central portion on the member, between the arms, for supporting the object clinched between the arms,

(d) a solar heat absorber,

(e) a conduit in contact with a portion of the solar heat absorber,

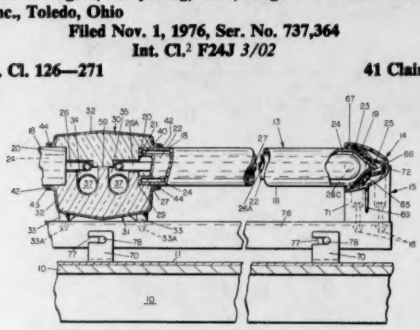
(f) the C-shaped member embracing the solar heat absorber and deforming it to embrace the conduit.

4,120,285

MODULAR TUBULAR SOLAR ENERGY COLLECTOR APPARATUS

Duane C. Nugent, Perrysburg, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 1, 1976, Ser. No. 737,364
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 41 Claims



1. A solar energy collection apparatus comprising

a hollow transparent cover tube closed at one end,

a hollow absorber tube closed at one end having a lesser outside dimension than the inside dimension of the cover tube and disposed within the latter and providing a space therebetween, the absorber tube having a solar energy absorbing surface comprised of a wave length selective coating exposed to solar radiation,

means sealing the space between said cover and absorber tubes near their other ends, said space being evacuated to subatmospheric pressure,

an elongated, continuous fluid conducting tubing that is non-reflective of thermal radiation comprised of two lengths thereof disposed adjacent each other and interconnected to each other at one end through a reverse bend portion, said two lengths and reverse portion being positioned in the absorber tube surrounded by the absorbing surface and extending along a major portion of the axial length thereof, and

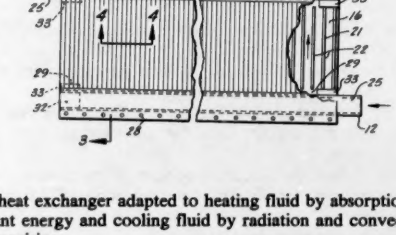
a fluid supply means connected to one of the two lengths of the fluid conducting tubing for circulating a fluid therethrough.

4,120,286

RIDGED SURFACE SOLAR HEATER

Joseph Farber, 1605 Sherington Pl., Newport Beach, Calif. 92663

Filed Jun. 7, 1976, Ser. No. 693,702
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 3 Claims



1. A heat exchanger adapted to heating fluid by absorption of radiant energy and cooling fluid by radiation and convection comprising:

a. a longitudinally extruded plastic panel having a substantially flat bottom surface, an upper surface parallel to the bottom surface, and a plurality of tubular channels parallel to each other and to the top and bottom surfaces, said channels being longitudinally disposed between the upper and lower panel surfaces, said upper panel surface longitudinally extending an equidistant amount beyond both ends of the channels and said lower panel surface longitudinally extending an equal and equidistant amount beyond both ends of the channels;

b. a curvilinear cross-section inlet manifold tube disposed parallel to one edge of the panel and perpendicular to the longitudinal axis of the panel, said inlet manifold tube having a plurality of outlet holes each having a smaller cross-sectional area than the manifold tube cross-sectional area, disposed along the length thereof adjacent to the entrances to the tubular channels within the panel;

c. coupling between the panel and the inlet manifold comprising a fluid-tight bond between the bottom surface of one upper panel surface extension and the top curvilinear surface of the inlet manifold tube, and a fluid-tight bond between the upper surface of the corresponding lower panel surface extension and the lower curvilinear surface of the inlet manifold;

d. a curvilinear cross-section outlet manifold tube disposed parallel to the opposite edge of the panel and perpendicular to the longitudinal axis of the panel, said outlet manifold tube having a plurality of inlet holes each having a smaller cross-sectional area than the manifold tube cross-sectional area, disposed along the length thereof adjacent to the outlets of the tubular channels within the panel;

e. coupling between the panel and the outlet manifold comprising a fluid-tight bond between the bottom surface of the opposite upper panel surface extension and the top curvilinear surface of the outlet manifold tube, and a fluid-tight bond between the upper surface of the corresponding lower panel surface extension and the lower curvilinear surface of the outlet manifold, and

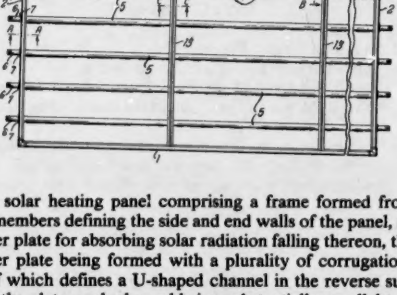
f. extensions of the upper and lower panel surfaces beyond the outside edges of the manifold tubes, each upper extension being conformally adhered to the corresponding lower extension is a lap joint, comprising thereby flanges disposed along the outside edges of the inlet and outlet manifold tubes, said flanges being adapted to mounting the heat exchanger onto a supporting structure.

4,120,287

SOLAR HEATING PANELS

Kevin C. Marles; Brian W. Spencer, both of Torquay, and Raymond Spencer, St. Ives, all of England, assignors to Solar Apparatus & Equipment Limited, London, England

Filed Mar. 16, 1977, Ser. No. 778,229
Claims priority, application United Kingdom, Apr. 13, 1976, 15022/76
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 14 Claims



1. A solar heating panel comprising a frame formed from frame members defining the side and end walls of the panel, an absorber plate for absorbing solar radiation falling thereon, the absorber plate being formed with a plurality of corrugations each of which defines a U-shaped channel in the reverse surface of the plate, each channel being substantially parallel to a side wall of the panel and each channel having a semi-cylindri-

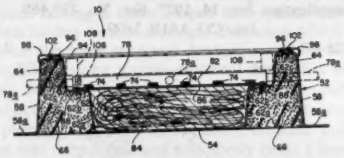
cal internal surface, a corresponding plurality of cylindrical tubes for carrying a liquid to be heated, the external diameter of each tube being equal to the internal diameter of the semi-cylindrical internal surface of the associated U-shaped channel, and locating means for locating the tubes within the U-shaped channels, the locating means comprising upper locating means bearing on the upper curved surfaces of the corrugations in the absorber plate, and lower locating means bearing on the lower surfaces of the tubes, the upper locating means including bar members and the lower locating means including inverted T-bars, and both the bar members and the T-bars being secured to the side frame members in positions for effectively clamping the upper parts of the cylindrical surfaces of the tubes in heat conducting contact with the internal semi-cylindrical surfaces of the U-shaped channels.

4,120,288

SOLAR COLLECTOR

Walter H. Barrett, Woonsocket, R.I., assignor to Columbia Chase Corporation, Braintree, Mass.

Filed Jan. 21, 1977, Ser. No. 761,450
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **9 Claims**



1. A solar collector comprising

A. a monolithic frame formed of a resin material and back assembly, said assembly having

(1) a back wall,

(2) an upstanding side wall extending around the periphery of the back wall, said side wall being composed of a pair of spaced-apart inner and outer wall sections and a bridging web connecting the inner and outer sections so as to form a channel all around the collector,

B. an absorber plate,

C. means for positioning the absorber plate in the assembly so that the absorber plate is spaced from and substantially parallel to the assembly back wall,

D. a light transmitting outer anti-convection cover substantially coextensive with the frame assembly, having a coefficient of expansion about that of said resin material and

E. means for securing the anti-convection cover to said bridging web, said panel further including a mass of insulation material filling the channel between the side wall sections,

F. the inner wall section of the assembly is formed with an intermediate step spaced parallel to the assembly back wall and extending all around the periphery of the back wall so as to define the positioning means, and

G. the absorber plate is seated on said step so as to define an enclosed space between the absorber plate and the back wall.

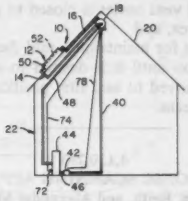
4,120,289

REFRIGERANT CHARGED SOLAR WATER HEATING STRUCTURE AND SYSTEM

Edward W. Bottum, 9357 Spencer Rd., Brighton, Mich. 48116

Filed Apr. 20, 1977, Ser. No. 789,010
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **3 Claims**

1. A solar water heating system comprising a solar collector structure, a heat exchange structure, said heat exchange structure comprising a closed vessel, tubular means in said vessel, said tubular means having inlet and outlet means extending from said vessel, water storage means, said inlet and outlet means being connected to said water storage means, and pump means connected in one of said inlet and outlet means between said tubular means and said water storage means for circulation of water from said water storage means through said tubular means to heat same and thence back to said water storage means, means for circulating a refrigerant heat transfer medium in gaseous form from the collector structure to the interior of said closed vessel and in liquid form from the closed vessel to the collector structure thereby forming a solar energy system, and a refrigerant heat transfer medium in said solar energy system, said solar collector structure including refrigerant flow structure adapted for the flow of fluid refrigerant therethrough, said last mentioned structure having a lower



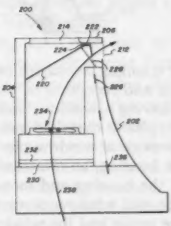
portion adapted to be flooded with liquid refrigerant and an upper portion contiguous therewith to receive gaseous refrigerant which boils off the liquid refrigerant, electrical control means operative to discontinue operation of the system when the temperature of the water in the storage means reaches a predetermined level and to discontinue operation of this system when the temperature differential in the heat exchange structure is insufficient to cause effective transfer of heat for heating of water, the internal volume of said vessel being greater than the total internal volume of said solar collector structure and said tubular means connecting such vessel and said solar collector structure so that liquid refrigerant may be stored in the vessel during times when operation of the system is discontinued, said solar collector being located to receive sun rays.

4,120,290

VENTING AND RECIRCULATING VENT KITCHEN HOOD

Leon O. Bowen, Jr., and Michael T. McVean, both of Cleburne, Tex., assignors to Rangaire Corporation, Cleburne, Tex.

Division of Ser. No. 700,216, Jun. 28, 1976, Pat. No. 4,088,123.
This application Sep. 23, 1977, Ser. No. 836,212
Int. Cl.[2] F24C *15/08*; F23J *11/00*
U.S. Cl. 126—299 D **3 Claims**



1. A kitchen stove hood for selectively providing air ventilation or recirculation in a kitchen area over a stove and having top, bottom, sides, back and front portions;

said hood including an air intake opening at said bottom portion;

a fan for causing air from the kitchen area to flow through said air intake opening;

an air recirculation outlet in said hood for recirculating air to the kitchen area;

an air vent outlet in said hood for venting air from the kitchen area;

a damper blade mounted for movement between a first position adjacent said recirculation outlet and a second position adjacent said vent outlet for selectively opening and closing said outlets;

spring means for normally biasing said damper blade in said first position adjacent said recirculation outlet;

means for moving said damper blade between said first and second positions, such that when said damper blade is in said first position and recirculation outlet is closed and said vent outlet is open to vent air outside the kitchen area, and when said damper blade is in said second position said spring means is extended and said recirculation outlet is open and said vent outlet is closed to recirculate air into the kitchen area; and

releasable means for maintaining said damper blade in said second position until it is desired to allow said damper blade to be moved to said first position by the action of said spring means.

4,120,291
ULTRASONIC SCANNING APPARATUS

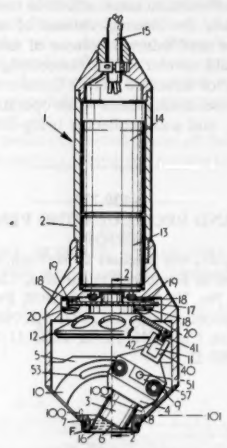
John Stewart Paton, Beith, and Alexander Shaw, Glasgow, both of Scotland, assignors to Greater Glasgow Health Board, Scotland

Filed Jan. 13, 1976, Ser. No. 648,666

Claims priority, application United Kingdom, Jan. 17, 1975, 2020/75

Int. Cl.[2] A61B 5/00

U.S. Cl. 128—2 V **10 Claims**



1. An ultrasonic scanning device for use in examining a mass by the transmission and reception of ultrasonic signals, comprising a housing having a window, and a thin, ultrasonically transparent flexible plastic stretched membrane secured across said window to provide a window closure, mounting means secured within the housing, an ultrasonic transmission/reception probe within the housing and mounted in the mounting means so as to face said window closure, ultrasonic coupling means between the probe and the window closure and means for moving the probe, said ultrasonic coupling means including a coupling fluid and a rolling diaphragm sealingly secured to the probe and to the housing around said window to sealingly enclose a window space between the probe and the membrane, the coupling fluid filling the window space and being confined by the diaphragm between the probe and the membrane, the mounting means constraining the probe so that the latter can effect a pivoting movement relative to the housing only in a plane through said window closure and the moving means being arranged to oscillate the probe rapidly between extreme positions of said planar pivoting movement to provide real-time scanning, the ultrasonic coupling means being arranged to deform with oscillating movement of the probe such that the window closure can be kept stationary relative to the surface of the mass being examined while the probe is oscillated rapidly in a desired plane while transmitting and receiving ultrasonic signals through said window closure to achieve real-time scanning of the mass being examined.

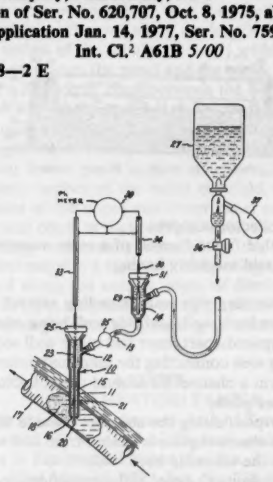
4,120,292
IMPLANTABLE ELECTROCHEMICAL SENSOR HAVING AN EXTERNAL REFERENCE ELECTRODE

Oliver H. LeBlanc, Jr.; Leonard W. Niedrach, and William H. Stoddard, Jr., all of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 620,707, Oct. 8, 1975, abandoned. This application Jan. 14, 1977, Ser. No. 759,468

Int. Cl.[2] A61B 5/00

U.S. Cl. 128—2 E **2 Claims**

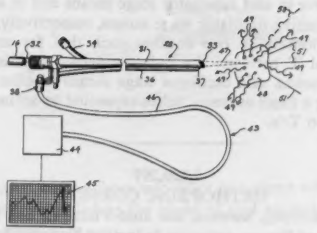


1. A specific ion sensor assembly for in vivo use comprising an insulated sensing electrode having an electrochemically active portion at one end, a catheter receiving coaxially and enclosing a portion of the insulated length of the sensing electrode and having an open end through which the electrochemically active portion of the sensing electrode extends exteriorly of the catheter for contact with a substance of a living organism to be tested, the catheter also having a laterally extending branch, means for delivering electrolyte into the catheter in proximity to the electrochemically active portion including a conduit connected to the catheter branch and communicating with the catheter through said branch for delivery of electrolyte into the catheter from an electrolyte reservoir, a chlorided silver reference electrode positioned in the conduit at a point removed from the catheter branch and exposed for direct contact with electrolyte flowing through the conduit and into the catheter and through the open end of the catheter, an electrolyte consisting essentially of an injectable isotonic solution flowing in the conduit in contact with the reference electrode and into the catheter branch and out of the catheter, and electrical conductor means for connecting the sensing electrode and the reference electrode to electrical readout means including a sensing electrode lead and a reference electrode lead.

4,120,293
LASER SYSTEM AND METHOD

Myron C. Muckerheide, Schofield, Wis., assignor to A. Ward Ford Memorial Institute, Inc., Wausau, Wis.

Filed Sep. 17, 1976, Ser. No. 724,119
Int. Cl.[2] A61B 6/00
U.S. Cl. 128—2 A 10 Claims

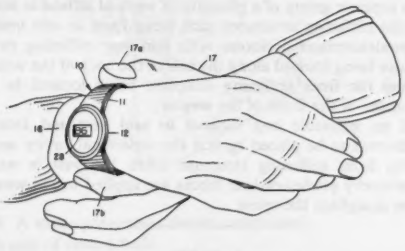


1. A system selectively conducting a laser beam to vaporize absorbing material located at an internal area of a living mammal, comprising a laser generator selectively supplying a laser beam having a predetermined wavelength, and a laser amplifier crystal having a beam output face spaced from a beam input face having a cross-sectional dimension which is greater than twice the cross-sectional dimension of said output face, said amplifier having a cross-sectional dimension which continuously decreases from a point adjacent said input face to a point adjacent said output face and providing a tapered spontaneous pumping zone of substantially reduced cross-section adjacent said output face and selectively emits a laser beam of said predetermined wavelength from said output face into said internal area and vaporizing said absorbing material.

4,120,294
ELECTRODE SYSTEM FOR ACQUIRING ELECTRICAL SIGNALS FROM THE HEART

Donna L. Wolfe, 32511 Sea Island Dr., Laguna Niguel, Calif. 92677

Filed Aug. 26, 1976, Ser. No. 718,017
Int. Cl.[2] A61B 5/02
U.S. Cl. 128—2.05 T 15 Claims

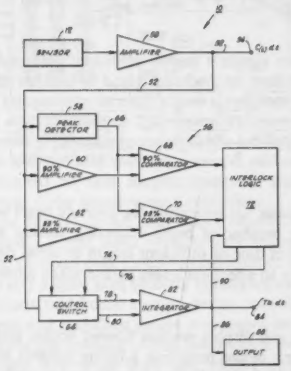


1. An electrode system for sensing heart activity comprising a wristband adapted to be worn on the wrist of one hand and having inner sensing electrode means directly engagable with such wrist; insulating barrier means extending over said inner sensing electrode means for shielding the same against contact with any part of the wearer's body except said wrist; outer sensing electrode means carried by said wristband and electrically isolated from said inner electrode means by said insulating barrier means; said inner and outer sensing electrode means being disposed on oppositely-facing sides of said wristband with said barrier means interposed between said inner and outer sensing electrode means; said outer sensing electrode means being exposed and adapted for selective contact by the fingers of the wearer's other hand; and sensing circuit means disposed in said wristband in electrical circuit with said inner and outer electrode means for sensing electrical signals derived therefrom that are representative of the electrical activity of the wearer's heart.

4,120,295
APPARATUS FOR INTEGRATION OF FLUID DILUTION CURVES

Thomas A. Hill, 2645 NW. 26th, Oklahoma City, Okla. 73107

Filed Dec. 13, 1976, Ser. No. 750,278
Int. Cl.[2] A61B 5/02
U.S. Cl. 128—2.05 F 6 Claims



1. A circuit for analyzing a time analog concentration curve of the type derived in blood flow analysis in response to introduction of an indicator in the blood system, comprising:

sensing means coactive with the bloodstream for developing an indicator concentration curve in the form of a time analog electrical signal of the type having an initial rise from a base value, through a peak and subsequent exponential decay to said base value;

an input terminal receiving said time analog electrical signal;

a first switching means having input and output;

a first resistance connected between said input terminal and the input to the first switching means;

a second switching means having input and output;

a second resistance connected between said input terminal and the input to said second switching means;

an operational amplifier receiving input from said first and second switching means output;

a capacitor connected from the output of said operational amplifier to said input thereof;

first means receiving input from said operational amplifier and being operative to close said first switching means upon departure of said time analog electrical signal from said base value through initial rise, peak and exponential decay to a first selected value of peak amplitude;

second means including a comparator, receiving input of said time analog electrical signal and being operative to close said second switching means at a second selected value of peak amplitude greater than said first selected value of peak amplitude;

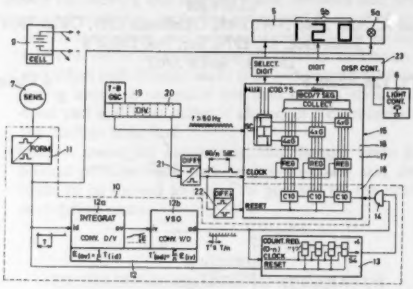
third means including a comparator, receiving input of said time analog electrical signal to open each of said first and second switching means at said first selected value of peak amplitude; and

output means receiving output of said operational amplifier to provide an analog voltage indication proportional to the total concentration curve integral.

4,120,296
PULSIMETER

Francois Prinz, Brügg, Switzerland, assignor to Heuer-Leonidas S.A., Berne, Switzerland

Filed Jun. 3, 1976, Ser. No. 693,064
Claims priority, application Switzerland, Jun. 4, 1975, 7188/75
Int. Cl.[2] A61B 5/02
U.S. Cl. 128—2.05 T 8 Claims



1. A pulsimeter for indicating the average heart beat rate by counting the number of beats occurring during a predetermined period of time of sufficient length to offset deviations in duration liable to affect each said period taken alone, comprising:

a case,

a counting and display portion housed within said case, and

pulse-sensing means including a fitting suitable for gripping a part of the human body where the pulse can be detected, and a sensor mounted in said fitting for application flat against said part of the human body;

said counting and display portion comprising:

an electronic circuit to which said sensor is electrically connected,

a source of electrical energy mounted in said case and connected to said electronic circuit for powering said circuit, and

a display device mounted within said counting and display portion;

said electronic circuit comprising:

counter means,

input processing means connected to said pulse-sensing means for applying input pulses to said counter means, the number of said input pulses applied during said predetermined period of time being substantially proportionate to the number of pulse beats detected by said sensor during said period of time, said period of time being equal to $60/n$ seconds, n being a whole-number factor of 60,

reset means for resetting said counter means at the beginning of each said period of time,

memorization means for storing the value attained by said counter means at the end of each said period of time and for retaining said value until the end of the following said period of time, and

display control means connected to said memorization means and to said display device for causing said display device to display the value contained in said memorization means, said value representing the pulse rate detected;

said input processing means comprising:

pulse-former stage means receiving a signal from said sensor and supplying a pulse of fixed and predetermined duration and amplitude for each heart beat detected by said sensor,

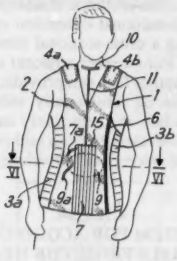
integrator stage means for converting interval duration into voltage, said integrator stage means receiving said pulses from said pulse-former stage means and supplying a voltage varying as a direct function of the duration of the intervals between said pulses from said pulse-former stage means, and

voltage-sensitive oscillator stage means for converting voltage into interval duration, said voltage-sensitive oscillator stage means receiving said voltage from said integrator stage means and supplying a signal to said counter means having pulses recurring at intervals varying in duration as a direct function of said voltage, said direct functions operative in said integrator stage means and in said voltage-sensitive oscillator stage means, respectively, bearing a relationship to one another such that for any given interval T between the pulses entering said integrator stage means, said oscillator stage means supplies a signal having n times as many pulses separated by an interval T' equal to T/n.

4,120,297
ORTHOPEDIC CORSET

Pierre Rabischong, Saussan, and Jean-Pierre L. Bel, Montpellier, both of France, assignors to Institut National de la Sante Et de la Recherche Medicale, Paris, France

Filed Feb. 24, 1977, Ser. No. 771,549
Claims priority, application France, Mar. 5, 1976, 76 07576
Int. Cl.[2] A61F 5/02
U.S. Cl. 128—78 11 Claims



1. An orthopaedic corset for correcting the deformations of the spine, comprising:

a vest made of non-stretch material which envelopes the trunk of the wearer;

separate front and rear stiffening structures, each comprising a separate group of a plurality of vertical inflatable tubes, said stiffening structures each being fixed to said vest in predetermined positions, with said rear stiffening structure being located along the axis of the back of the wearer and the front stiffening structure being located in the center of the front of the wearer;

and an inflatable bag secured to said vest and located thereon to be placed against the abdominal cavity under the front stiffening structure when the vest is worn, whereby predetermined forces are applied to the wearer to straighten the spine.

4,120,298
IMPLANT TO SECURE THE GREATER TROCHANTER

Irving E. Fixel, 111 N. 31 Ave., Hollywood, Fla. 33021

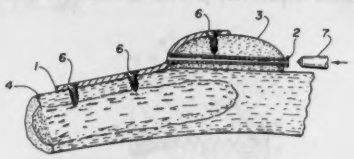
Filed Dec. 6, 1976, Ser. No. 748,234
Int. Cl.[2] A61F 5/04; A61B 17/18
U.S. Cl. 128—92 D 5 Claims

1. A bone implant fixation device for support and fixation of the greater trochanter to the femur by implantation in skeletal bone, comprising

a plate member, comprising a thin metal plate having a first portion which is adapted to fit over the exterior surface of the femur shaft and a second portion adapted to fit over the exterior surface of the trochanter, said first and second portions having a bend therebetween, said bend being adapted to extend across the meeting ends of the trochan-

ter and the femur shaft and to space apart said first portion and said second portion of the plate member in substantially parallel planes,

a plurality of hollow pin members attached to said plate member at the location of said bend such that said pin



members extend from said plate in a plane which is substantially parallel to the plane of said second portion of said plate,

fastener means extending through said plate member adapted to secure said implant device to skeletal bone to which the implant device is to be applied.

4,120,299

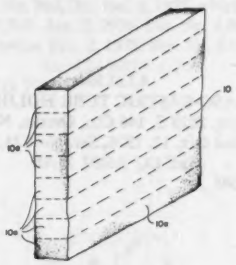
SNORE-PREVENTION ARTICLE AND PROCESS FOR MANUFACTURING THE SAME

Joseph J. Russo, 6240 B Tapia Dr., Malibu, Calif. 90265

Continuation-in-part of Ser. No. 679,526, Apr. 23, 1976, abandoned. This application Dec. 22, 1976, Ser. No. 753,399

Int. Cl.[2] A62B *7/10*

U.S. Cl. 128—140 N **6 Claims**



1. A snore-prevention device comprising:

a pair of cotton balls,

said cotton balls being of a size and shape to fit into the vestibule of the human nose to block the flow of air through the nostril beneath the tip of the nose, leaving the area of the nostril immediately above the lip substantially open,

an elongate thread joining said cotton balls to form a dumbbell-like configuration,

said elongate thread having a length slightly longer than the distance between the vestibules of the human nose whereby said thread prevents the cotton balls from being drawn into the nose and permits easy removal, and

non-toxic securing means for securing said cotton balls to said elongate thread whereby said balls and said thread form a dumbbell-like configuration.

4,120,300

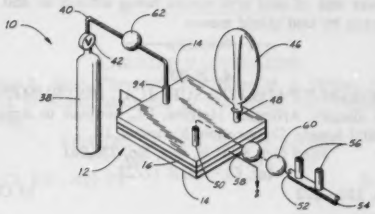
BREATHING APPARATUS

Brian L. Tiep, Monrovia, Calif., assignor to City of Hope National Medical Center, Duarte, Calif.

Filed Nov. 29, 1976, Ser. No. 745,591

Int. Cl.[2] A61M *16/00*

U.S. Cl. 128—203 **13 Claims**



1. In a breathing apparatus having a supply means for supplying a gas capable of being breathed, an enclosed reservoir means for temporarily storing a gas, a respiration means for conveying a gas to and from the respiratory tract of an individual and a control means responsive to the inhalation and exhalation from and into said respiration means, said control means being connected to said supply, reservoir and respiration means, in which the improvement comprises:

said fluidic control device comprises a bistable fluidic amplifier having a first input port directly connected to said source, a second port directly connected to said reservoir means and a third port directly connected to said respiration means, said fluidic control device containing no moving parts and including means responsive only to a variation in the gas pressure within said respiration means so as to permit flow from both said supply means and said reservoir means into said respiration means upon inhalation through said respiration means and so as to cause gas flow from said supply means into said reservoir means upon exhalation into said respiration means.

4,120,301

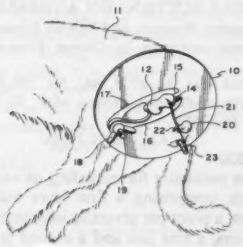
APPARATUS FOR SURGICAL PROCEDURES INVOLVING ANIMALS

James Shepperd Lovick, Henderson, Tex. 75652

Filed Nov. 8, 1976, Ser. No. 739,501

Int. Cl.[2] A61B *17/00*

U.S. Cl. 128—303 R **7 Claims**



1. An apparatus for use in the castration of an animal comprising:

a shield means having an upper surface and a lower surface with an aperture extending through said shield means, said aperture being adapted to receive the scrotum of said animal;

a scrotum retaining means adapted to engage and restrain said scrotum adjacent the upper surface of said shield means as said scrotum is pulled through said aperture; and

a spermatic cord restraining means adapted to engage and

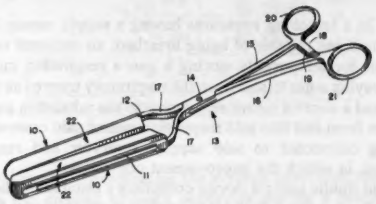
restrain a spermatic cord of said animal in a predetermined position when a testicle is withdrawn from the scrotum, said spermatic cord restraining means including means to elevate and restrain said spermatic cord above the upper surface of said shield means and comprising a clip means to engage said spermatic cord, said clip means being operably affixed to the upper end of an arm means with the lower end of said arm means being affixed to and supported by said shield means.

4,120,302

DISPOSABLE PADS FOR SURGICAL INSTRUMENTS

John S. Ziegler, Arlington Heights, Ill., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Oct. 8, 1976, Ser. No. 730,961
Int. Cl.[2] A61B *17/28*
U.S. Cl. 128—322 13 Claims



1. A disposable pad for use with a surgical instrument comprising a resilient flexible elongated member of generally U-shaped cross sectional configuration having proximal and distal ends and having an open-sided channel therein for slidably receiving a supporting element of said instrument, stop means provided by said pad adjacent said distal end for limiting the longitudinal insertion of said element into said channel from the proximal end of said member, retention means for preventing transverse movement of said element out of said channel, said retention means being located adjacent the proximal end of said flexible elongated member and completely bridging said channel, and latching means provided by said member for securing said element against longitudinal displacement from said channel, said latching means normally being disposed in a latching position but being shiftable into a releasing position as said elongated member is flexed.

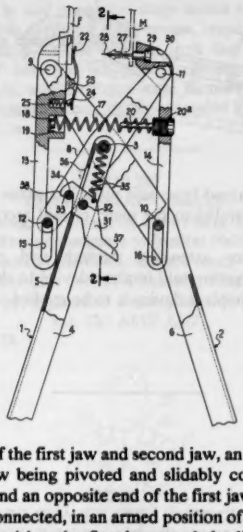
4,120,303

TONGS, IN PARTICULAR FOR MOUNTING EAR-BUTTONS ON ANIMALS

René Villa-Massone, Sannois, and Michel Divaret, La Milesse, both of France, assignors to Cooper France S. A., Paris, France

Filed Mar. 24, 1977, Ser. No. 780,826
Claims priority, application France, Mar. 29, 1976, 76 09024; Nov. 17, 1976, 76 34618
Int. Cl.[2] A01K *11/00*
U.S. Cl. 128—330 14 Claims

1. A tongs, in particular for mounting an ear-button or earring on animals, comprising a first lever and second lever forming handles, a pivot pin pivotally interconnecting the first and second levers, a first jaw and a second jaw movable between an open position and a closed position, a return spring for returning the jaws to the open position of the jaws, means for connecting the first and second levers respectively to the first and second jaws for shifting the jaws to the closed position of the jaws and comprising a mechanism for temporarily maintaining the jaws parallel to each other, rapidly-actuated means for shifting the jaws to the open position of the jaws when the first and second levers are moved toward each other beyond a position of the levers corresponding to said closed position of the jaws, the mechanism for temporarily maintaining the jaws parallel to each other comprising a link, a branch of the second lever, the link being pivoted to the branch substantially in the middle of the branch, means for rendering the link integral with the first lever and comprising said pivot pin and temporary immobilizing means which are interposed between the link and the first lever, the first and second jaws having end portions carrying means for holding respective parts of the ear-button, the branch of the second lever and the link having end portions respectively pivoted to respective ones of said



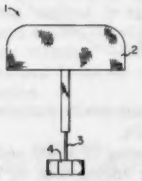
end portions of the first jaw and second jaw, an opposite end of the second jaw being pivoted and slidably connected to the second lever and an opposite end of the first jaw being pivoted and slidably connected, in an armed position of the tongs, to an assembly comprising the first lever and the link, which first lever and link are rendered integral with each other by the temporary immobilizing means.

4,120,304

NASO-GASTRIC TUBE HOLDER

Burdette J. Moor, 2029 S. 146 Cir., Omaha, Nebr. 68144

Filed Oct. 12, 1976, Ser. No. 731,185
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—348 6 Claims



1. Apparatus for holding a naso-gastric tube in position relative to a patient's nares comprising

(a) a rigid slotted holding means removably attached and adapted to be selectively movably affixed by frictional engagement to the naso-gastric tube

(b) adhesive securing means adapted to be removably affixed to the exterior of the patient's nose; and

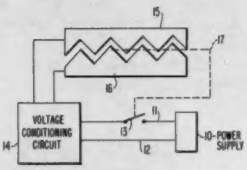
(c) flexible elongate connector means affixed at one end to said holding means, and affixed at the other end to said adhesive securing means.

4,120,305

SYSTEM FOR ADMINISTERING AN ELECTRIC SHOCK

Kevin George Rhoads, Lehighton, Pa., and George Michael Plotkin, Massapequa Pk., N.Y., assignors to VRL Growth Associates, Inc., Boston, Mass.

Filed Sep. 10, 1976, Ser. No. 722,313
Int. Cl.[2] A61N *1/38*
U.S. Cl. 128—405 32 Claims



1. A personal defense system comprising in combination,

a normally quiescent electrical circuit means which, when activated generates an electrical voltage waveform which has a relatively high voltage portion to break down the skin resistance of an assailant, and then couples directly to the assailant's sensory nerves a lower amplitude signal within the passband of the nerves of the human body, said lower amplitude signal being of sufficient amplitude to temporarily disable said assailant, and

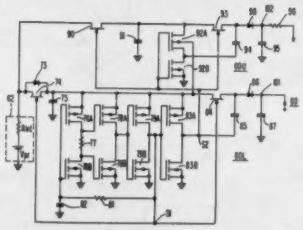
a pair of output electrodes connected to said normally quiescent electrical circuit means, said circuit means being activated only upon the presence of a portion of said assailant's body between said pair of output electrodes to produce between said electrodes said electrical voltage waveform.

4,120,306

CARDIAC PACER WITH PRE-PROGRAMMED POWER SOURCE INTERFACE MEANS

Alexis C. M. Renirie, Dieren, Netherlands, assignor to Vitatron Medical B.V., Dieren, Netherlands

Division of Ser. No. 802,736, Jun. 2, 1977, which is a division of Ser. No. 651,549, Jan. 2, 2976, Pat. No. 4,031,899. This application Feb. 2, 1978, Ser. No. 874,611
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—419 PT 12 Claims



1. Pacer apparatus for use in combination with an electrode for supplying pacing stimulus signals, said apparatus having

a power source having internal resistance characteristics which vary with energy depletion thereof, said internal resistance characteristics being substantially linear until a knee is reached, at which point the internal characteristic of the source increases sharply, and

a stimulus generator for generating stimulus signals, said generator having a stimulus signal rate which is a function of the voltage provided thereto, and further characterized by comprising

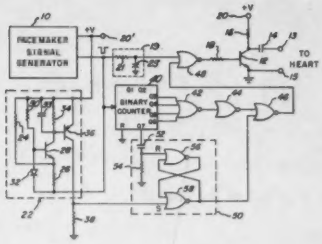
connecting means for connecting power from said DC power source to said stimulus generator, said connecting means having a voltage transmission characteristic which is a predetermined function of said source internal resistance, said transmission characteristic changing substantially at said knee, whereby the voltage provided to said stimulus generator changes substantially when said knee is reached, producing a change of said stimulus signal rate corresponding to the reaching of said knee.

4,120,307

CARDIAC PACEMAKER

Thomas L. Jirak, Plymouth, and Pieter M. J. Mulier, St. Paul, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Oct. 26, 1976, Ser. No. 735,632
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—419 PT 57 Claims



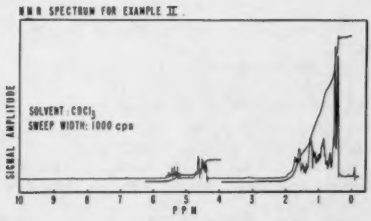
1. Apparatus for use with a signal generating pacemaker having a power supply and output means adapted for connection to a heart, comprising: first means for sensing a change in power supply condition; and second means connected and responsive to the first means for repetitively applying a benign arrhythmia inducing arrhythmic signal to the output means in response to a change in power supply condition.

4,120,308

SUBSTITUTED NORBORNANE DERIVATIVES USED IN THE PROCESS OF FLAVORING TOBACCO AND THE PRODUCT THEREOF

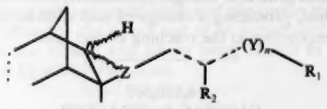
Kenneth K. Light, Long Branch; James Milton Sanders, Eatontown; Manfred Hugo Vock, Locust, all of N.J.; Edward J. Shuster, Brooklyn, N.Y.; Joaquin Vinals, Red Bank, N.J.; William L. Schreiber, Jackson, N.J.; John B. Hall, Rumson, N.J.; Denis E. Hruza, Sr., Bricktown, N.J.; Venkatesh Kamath, Red Bank, N.J.; Braja Dulal Mookherjee, Holmdel, N.J.; Ching Y. Tseng, Middletown, N.J., and Mark A. Sprecker, Sea Bright, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 765,847, Feb. 4, 1977, Pat. No. 4,076,853. This application Dec. 13, 1977, Ser. No. 860,134
Int. Cl.[2] A24B *3/12*
U.S. Cl. 131—17 R 3 Claims

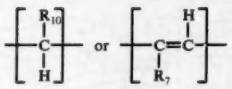


2. A smoking tobacco composition comprising smoking

tobacco and intimately admixted therewith an organoleptic property augmenting or enhancing quantity of a composition comprising a norbornane derivative having the structure:

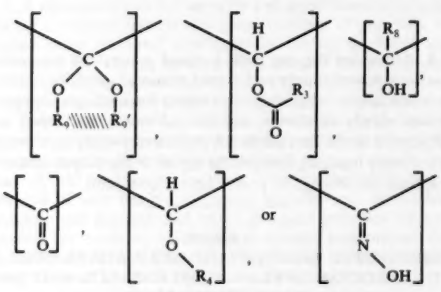


wherein each of the dashed lines represents a carbon-carbon single bond or a carbon-carbon double bond with the proviso that at least one of the dashed lines is a carbon-carbon single bond; wherein n is 0 or 1 with the proviso that n is 1 when both dashed lines are carbon-carbon single bonds and n is 0 when one of the dashed lines is a carbon-carbon double bond; wherein R_1 and R_2 are each the same or different hydrogen or lower alkyl; wherein Y is*



("cis and/or "trans")

wherein Z is one of the moieties:



wherein R_3 and R_4 are each alkyl; wherein R_7, R_8 and R_{10} are each the same or different hydrogen or lower alkyl; wherein R_9 and R_9' taken separately are the same or different lower alkyl, or taken together is lower alkylene; wherein the dotted line represents a carbon-carbon single bond or a carbon-carbon double bond; and wherein each of the wavy lines represents, in the alternative, exo or endo isomers.

4,120,309

HAND OPERATED DEVICE FOR PRODUCING TOBACCO ARTICLES LOW IN NOXIOUS SUBSTANCES

Victor Brantl, Frauenplatz 10, 8 Munich 2, and Wolfgang Seeger, Portenlaengerstr. 17, 8022 Gruenwald, both of Fed. Rep. of Germany

Filed Nov. 11, 1976, Ser. No. 740,871

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1976, 2639820

Int. Cl.[2] A24F *13/00, 25/00, 47/00*

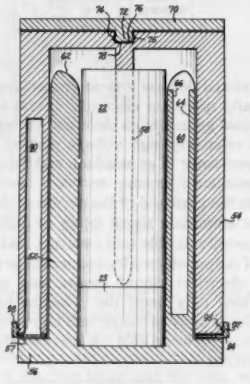
U.S. Cl. 131—170 R **15 Claims**

1. A portable manually actuated device for modifying preformed tobacco articles to render the tobacco articles with a low carbon monoxide content, comprising:

a substantially tubular holder having a tobacco article-receiving opening for receiving therein the entire length of the tobacco article, said tubular holder comprising a cylindrical base, a tubular holding portion extending from said base, said holding portion having an inside diameter allowing snug holding of a preformed tobacco article, an outside diameter which is smaller than the diameter of said base, a length which is sufficient to substantially receive the entire length of said preformed tobacco article; and

tobacco displacement means extending cooperatingly with respect to said tobacco article receiving end into said tubular holder, said tobacco displacement means comprising

a tubular member having a closed end and an open end, side walls forming an outside diameter and an inner diameter approximately equal to the diameter of the outside diameter of said tubular holder, whereby said tubular member is adapted to telescopically slide at its open end over said tubular holder at its end having the tobacco article-receiving opening,



a tobacco displacing mandrel centrally arranged inside of said tubular member, said mandrel extending at a length which is less than the length of the preformed tobacco article and having an effective thickness sufficient to provide a tobacco-free longitudinal space congruent with the central longitudinal axis of said preformed tobacco article upon removal of said displacement means from the tobacco article, and

wherein said tubular holder comprises a helical thread on its outer diameter, said tubular member of said tobacco displacement means comprises a cooperating helical thread on its inside diameter, whereby said tobacco displacement means is caused to rotate with respect to said tubular holder when the two are longitudinally moved in telescoping arrangement.

4,120,310

FILTER FOR CIGARETTES, CIGARS AND THE LIKE

Choon Bae Lee, 273-22, and Byung Chul Lim, 35-13, both of Roryang jin-2-dong, Kwanak-koo, Seoul, Korea

Filed Dec. 10, 1976, Ser. No. 749,614

Int. Cl.[2] A24D *7/04*

U.S. Cl. 131—261 B **4 Claims**

1. A smoking filter for use in cigarettes, cigars, cigarette holders and tobacco pipes, comprising:

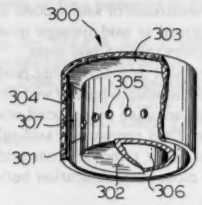
a first cylindrical tube having a plurality of openings around the circumference thereof, said first tube being open at the top thereof;

a bottom covering across the bottom of said first cylindrical tube;

a second cylindrical tube surrounding and spaced from said first tube, said second tube being substantially the same height as said first tube;

a first flange extending from the top edge of said first tube to

the top edge of said second tube across the space between said first and second tubes; and



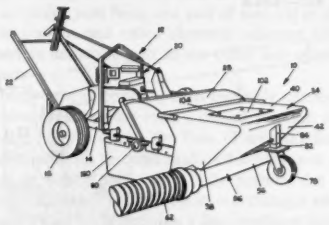
a first attack surface surrounding the inside of said second cylindrical tube opposite said openings in said first cylindrical tube.

4,120,311

VACUUM OPERATED DEBRIS REMOVAL APPARATUS AND METHOD FOR A POWER BROOM

Charles L. Dunham, and Thomas H. Kiernan, both of Grand Rapids, Mich., assignors to Gravel-Vac Service Co., Inc., Grand Rapids, Mich.

Filed Feb. 4, 1977, Ser. No. 765,776
Int. Cl.² F01H *1/04*
U.S. Cl. 134—6 **19 Claims**



1. Vacuum operated debris removal apparatus for a power broom wherein debris is brushed from a surface by a rotating cylindrical broom, said debris removal apparatus comprising:

enclosed hopper means for collecting debris swept up by the power broom, said hopper means having inlet means for receiving debris from the power broom and outlet means for conveying debris from the hopper means, the hopper and outlet means being constructed such that debris collected in the hopper means can be removed from the hopper means through the outlet means by the application of a vacuum to the outlet means;

vacuum manifold means for applying a debris removing vacuum to the hopper outlet means, said manifold means including inlet means connected to the hopper outlet means and outlet means adapted to be connected to a vacuum source;

support means for movably supporting the hopper means with respect to the surface such that the weight of the debris removal apparatus is not carried by the brush of the power broom, the support means permitting the debris removal apparatus to be moved over a surface with the power broom; and

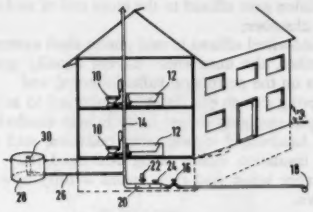
attachment means for attaching the debris removal apparatus to the power broom such that the hopper inlet means is maintained in position to receive debris from the power broom as the power broom is operated over the surface.

4,120,312

VACUUM-TYPE WATER REMOVAL SYSTEMS FOR BUILDINGS

Harald Richard Michael, Am Gosslers Park 9, 2000 Hamburg 55, Germany

Filed Nov. 28, 1977, Ser. No. 855,086
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1976, 2653713
Int. Cl.² E03D *1/00*
U.S. Cl. 137—236 R **10 Claims**



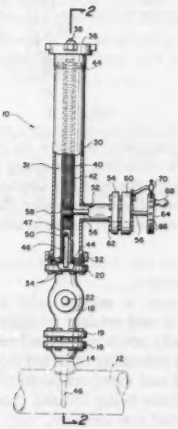
1. In a vacuum water removal system for buildings wherein waste water collected from facilities in the building is fed by gravity feed lines to a collection chamber connected to a vacuum line for removal of the collected waste water and wherein a check valve is connected between said collection chamber and said vacuum line which opens automatically when a predetermined maximum water level is reached, the improvement wherein a vented backwash receptacle is included in said system in fluid communication therewith at a location above the maximum water level in the collection chamber and below the facilities from which waste water is collected, the volume of said backwash receptacle being large as compared with that of said collection chamber.

4,120,313

COUPON HOLDER

Harvey L. Lewis, R.R. 4, Box 202, Independence, Kans. 67301

Filed Mar. 2, 1977, Ser. No. 773,744
Int. Cl.² G01N *33/00*
U.S. Cl. 137—268 **3 Claims**



1. A holder for inserting into and retrieving a corrosion coupon from a pipeline while under pressure comprising:

(a) an upstanding elongated cylindrical chamber;

(b) means at the lower end for sealing attachment of the

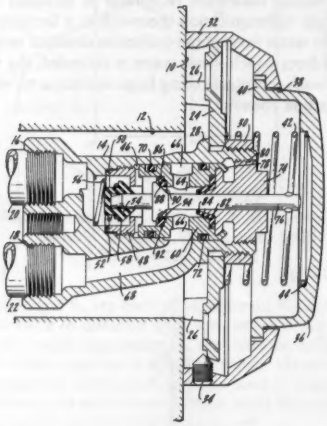
chamber to a valve, which is itself attached as an upwardly extending side branch to a pipeline;
(c) closure means at the upper end of said chamber for closing and sealing said chamber;
(d) an elongated rack inside said chamber, and means to guide said rack for longitudinal motion;
(e) insulating means at the lower end of said rack for support of a corrosion coupon;
(f) a horizontal side pipe attached to said chamber;
(g) a pinion shaft rotatably supported within said side pipe, the outer end extending sealably therefrom;
(h) a pinion gear affixed to the inner end of said shaft within said chamber;
(i) a handwheel affixed to said pinion shaft externally of said chamber, the handwheel having equally spaced detent holes on the peripheral suface thereof; and
(j) a spring driven pin slidably supported to said side pipe, the pin engaging detent holes in said handwheel to lock said handwheel in selectable positions, said rack means and insulation means being contained fully within said chamber when said rack means is fully upwardly withdrawn.

4,120,314

REMOTE ACTUATED FLUSH VALVE

Frederic Lissau, Chicago, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.

Filed Feb. 11, 1977, Ser. No. 767,740
Int. Cl.[2] F16K *43/00*
U.S. Cl. 137—329.4 **4 Claims**



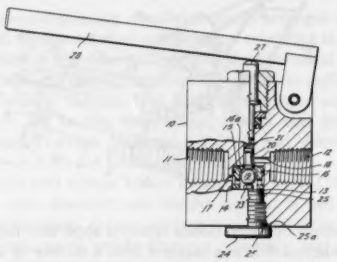
1. A hydraulic actuator for use in operating a remotely located flush valve including a housing, fluid inlet and outlet ports in said housing adapted to be connected to a flush valve, said inlet port normally being under fluid pressure derived from the flush valve, passage means in said housing connecting said ports,
a retainer member attached to said housing and positioned in said passage means,
a sleeve positioned in said passage means and in coaxial alignment with said retainer member,
a stem reciprocally positioned in said retainer and said sleeve and said stem extending outward from said housing,
first and second seal members positioned on said stem, said first seal member being located closer to said inlet port than said second seal member,
said first seal member being loosely held in said retainer member and a first seat defined by said retainer member in said passage means for said first seal member,
a flexible second seat member positioned in said passage means for contact by said second seal member,
support means for said second seat member located on the interior surface of said sleeve, said support means comprising an annular shoulder and a relieved area, said relieved area being downstream of said shoulder to prevent pressure build-up downstream of said second seat member,
spring means positioned in said passage means and urging said sealing members toward said seats,
said first and second seal members being positioned on said stem in spaced relationship whereby said first seal member is in an open position when said second seal member is in a sealing position, fluid pressure at said inlet urging said first seal member, after removal from said stem, against said first seat to close communication between said inlet and outlet ports.

4,120,315

VELOCITY CHECK VALVE

David E. Snyder, Longview, Tex., assignor to U.S. Industries, Inc., New York, N.Y.

Filed Aug. 24, 1977, Ser. No. 827,338
Int. Cl.[2] F16K *25/00*
U.S. Cl. 137—454.6 **9 Claims**



1. A velocity check valve including a housing having an inlet port and an outlet port and a bore located between said ports; a removable seat sleeve slidably received in said bore and having an annular seat at one end; a first passageway communicating said inlet port to the interior of said seat sleeve upstream of said seat; a second passageway communicating said outlet port with said seat on the downstream side thereof; a ball fitting loosely in said sleeve and adapted to engage said seat to prevent flow therethrough; a resiliently biased stem abutting said ball and urging it from seated position; a fixed stop adapted to abut the ball when it is in unseated position to limit its movement away from the seat; the ball and the interior of the seat sleeve being dimensioned to restrict flow past the ball to induce a pressure differential thereacross which increases and decreases proportional to increases and decreases in fluid flow rate, the ball being movable to seated position when pressure on the downstream side materially decreases below the upstream pressure, the bias exerted by the stem being insufficient to prevent such ball movement when said downstream pressure so decreases; the ball when unseated being free to turn to present different portions of its surface to the seat during its movement between seated and unseated positions.

4,120,316

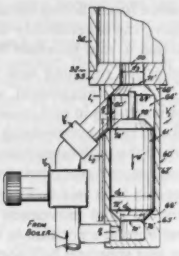
FLOW CONTROL VALVE ASSEMBLY

Glen P. Robinson, Jr., Atlanta, and Samuel V. Shelton, Stone Mountain, both of Ga., assignors to Scientific-Atlanta, Inc., Atlanta, Ga.

Division of Ser. No. 565,629, Apr. 7, 1975, Pat. No. 4,009,587, which is a continuation-in-part of Ser. No. 550,413, Feb. 18, 1975, Pat. No. 3,988,901. This application Feb. 28, 1977, Ser. No. 772,535

Int. Cl.[2] G05D *7/01*

U.S. Cl. 137—498 5 Claims



1. A flow control valve for controlling the flow of a working fluid therethrough from a pressurized source of fluid at a prescribed source pressure comprising:

a housing defining a valve chamber therein having opposed ends, an outlet port from one end of said valve chamber, an inlet port to said valve chamber adjacent said outlet port and an actuation port to the other end of said valve chamber;

a valve body having opposed ends movably carried within said valve chamber between a closed position in which said valve body prevents the flow of working fluid from said inlet port out through said outlet port, and an open position in which said valve body permits the flow of working fluid from said inlet port out through said outlet port, said valve body defining a first working face on one end thereof and a second working face on the opposite end thereof, said second working face continuously exposed to the pressure of the working fluid at said actuation port in both said open and closed positions, and said first working face exposed only to the pressure of the working fluid downstream of said outlet port when said valve body is in said closed position and exposed to the pressure of the working fluid at said inlet port when said valve body is in said open position; and

valve control means for selectively moving said valve body from said open position to said closed position, said control means continuously maintaining the pressure of the working fluid at said actuation port substantially at the prescribed source pressure and reducing pressure of the working fluid at said inlet port below the prescribed source pressure proportionally to the velocity of the working fluid flowing through said inlet port so that movement of said valve body from said open position is responsive only to a prescribed pressure differential between said inlet port and said actuation port generated by the velocity of the working fluid flowing through said inlet port and out through said outlet port and movement of said valve body from said closed position to said open position is responsive only to a prescribed pressure differential between the working fluid downstream of said outlet port and said actuation port independently of the pressure at said inlet port.

4,120,317

ANTI-LOCK VEHICLE BRAKE SYSTEMS

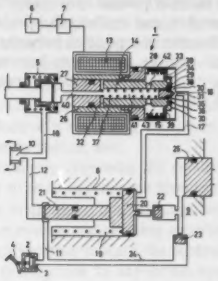
Derek Robert Skoyles, Salfords, near Redhill, England, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 366,307, Jun. 1, 1973, abandoned. This application Feb. 27, 1976, Ser. No. 661,987

Claims priority, application United Kingdom, May 11, 1973, 28586/73

Int. Cl.[2] F16K *31/06*

U.S. Cl. 137—509 2 Claims



1. A solenoid valve mechanism comprising a cooperating poppet and valve seat, a first bias spring for urging said poppet into sealing engagement with said valve seat, a solenoid armature carrying said poppet and including first means for selectively urging said poppet against said spring bias, a solenoid coil cooperating with said solenoid armature, said armature being provided with fluid sealing means and a second bias spring for urging said armature into a first position in which said fluid sealing means forms a fluid seal around said poppet and said valve seat, said first means urging said poppet against said spring bias only after an initial axial displacement of the armature from said first position, said initial axial displacement being caused by a solenoid force produced on energization of said solenoid coil, said mechanism further including second means for bleeding fluid intermediate said (1) cooperating poppet and valve seat and (2) said fluid sealing means when said mechanism is unenergized, said armature being dimensioned so that upon said initial displacement said fluid seal is broken; said armature, said poppet and said first means cooperatively engaging following said initial displacement and upon further axial displacement of the armature away from said first position to displace said poppet from said valve seat.

4,120,318

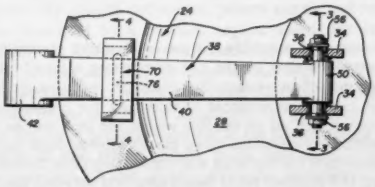
DAMPENING MEANS FOR SWING CHECK VALVE

Jerry W. Jourdan, Alvin, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Sep. 12, 1977, Ser. No. 832,485

Int. Cl.[2] F16K *15/03*

U.S. Cl. 137—527.4 7 Claims



1. In a check valve having a valve body with a valve chamber therein and flow passageways therethrough connected to said valve chamber, a clapper-type disc-shaped valve member,

an elongate arm pivotally supporting said valve member and being mounted within said valve body to swing freely between open and closed positions of the valve member, an improvement in said check valve comprising:

(a) support means secured to the back face of said disc-shaped valve member having an opening therethrough, said arm having a hub on the upper and lower ends thereof, a support pin received within the lower hub and extending through the opening in said support means, bushing around the pin and fitting within the opening; and

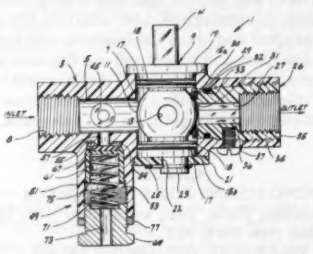
(b) a generally channel-shaped strap secured to the rear face of the valve member and extending about a mid-portion of said arm to restrain pivotal movement between the arm and valve member, and resilient dampening means extending around the arm at a position between the arm and the strap to limit relative movement between the strap and said arm and to absorb forces being transmitted between the arm and valve member.

4,120,319

MANIFOLD ASSEMBLY FOR COMPRESSED AIR STORAGE TANK OR THE LIKE

Joseph L. Krechel, Chesterfield, and Michael J. Purvis, Maplewood, both of Mo., assignors to Control Devices, Incorporated, St. Louis, Mo.

Division of Ser. No. 621,956, Oct. 14, 1975, Pat. No. 4,076,211.
This application Oct. 17, 1977, Ser. No. 842,661
Int. Cl.[2] F16K *24/00*
U.S. Cl. 137—583 **5 Claims**



1. A manifold assembly for use as an outlet manifold for a compressed air tank or the like comprising a manifold body having a main flow passage therethrough, said passage having an inlet end for attachment to said tank for communication with compressed air or the like within the tank and an outlet end, selectively operable valve means intermediate said inlet and outlet ends for blocking and unblocking flow through said passage, and pressure relief means disposed between said valve means and said inlet end for relieving pressure from within said tank in the event the pressure level within the tank exceeds a predetermined pressure level, said manifold body having a lateral bore of generally circular cross-section extending through said main flow passage, said valve means comprising a unitary ball valve member received in said lateral bore, said ball valve member being rotatable about the longitudinal axis of said lateral bore between a closed position in which it blocks flow through said passage and an open position in which it permits flow through said passage, said ball valve member comprising a generally spherical ball portion having an aperture therethrough constituting a portion of said flow passage when said ball valve member is in its open position, and a pair of circular sealing heads, one on each side of said ball portion, each of said sealing heads carrying a seal which slidably, sealingly engages the walls of said lateral bore so as to seal said ball member relative to said manifold body and to permit rotational and axial movement of said ball valve member within said lateral bore, said sealing heads being of substantially the same diameter so that pressure forces acting on said ball valve member which tend to move the latter axially within said bore are balanced, means external to said manifold body at each end of said ball valve member for retaining said ball valve member within said lateral bore by engagement with said manifold body, and seal means insertable in said main flow passage from one end thereof, said seal means comprising a seal body having a longitudinal bore therethrough constituting a portion of said main flow passage, and an end seal carried on the inner end of said seal body engageable with said ball portion, said retaining means permitting limited axial movement of said ball valve member in said lateral bore to a position in which said end seal is sealingly seated on said spherical ball portion for preventing leakage around said ball portion to said outlet when said ball member is in its closed position.

4,120,320

Patent Not Issued For This Number

4,120,321

TIMING DEVICE FOR A FLUID SIGNAL AND FLUID ACTUATOR THEREFOR

Charles P. O'Neil, Milwaukee, Wis., assignor to Amerace Corporation, New York, N.Y.

Filed Dec. 29, 1976, Ser. No. 755,471
Int. Cl.[2] F16K *31/165*
U.S. Cl. 137—271 **41 Claims**

1. In a timing device for providing a fluid signal at a given point upon the expiration of a prescribed timed interval following a given event, the timing device including

a frame;

a motion transmitting member mounted in the frame for movement along a prescribed path of travel in either one of two directions between a first location and a second location; and

timing means on the frame coupled with the motion transmitting member for effecting movement of the motion transmitting member at a predetermined rate in only one of said two directions to establish said timed interval

between the departure of said motion transmitting member from the first location thereof and the arrival of the motion transmitting member at the second location, and permitting return movement of the motion transmitting member from the second location to the first location at an unrescticted rate:

a fluid switching device on the frame, said switching device comprising

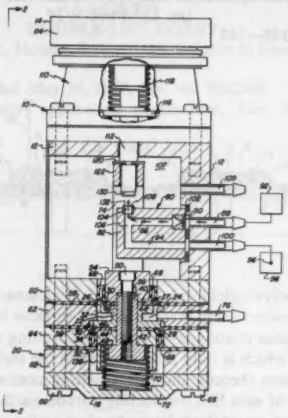
an input passage for a fluid input;

an output passage communicating with the given point;

a control passage communicating with the input and output passages;

switching means on the frame for operation between a first condition wherein the control passage is effective to divert the fluid input provided at the input passage away from the output passage, and a second condition wherein the control passage enables the fluid input to be directed to the output passage, the switching means being responsive to the motion transmitting member for operation from one to the other of the first and second conditions upon the arrival of the motion transmitting member at the second location thereof to provide a fluid signal at the given point, and wherein the timing device further includes;

a fluid actuator having a fluid chamber including a chamber wall extending between sealed longitudinally opposite



first and second ends, and a piston within the chamber spaced laterally from the chamber wall and movable longitudinally between a first position located adjacent the first end of the chamber and a second position located adjacent the second end of the chamber;

coupling means coupling the piston with the motion transmitting member such that the motion transmitting member is retained in the first location thereof when the piston is in the first position and the motion transmitting member is free to move toward the second location thereof, under the influence of the timing means, when the piston is in the second position;

resilient biasing means biasing the piston in a given direction toward one of the first and second positions and the respective one of the first and second ends of the chamber;

a diaphragm extending between the piston and the chamber wall at the end of the chamber opposite said one end toward which the piston is biased; and

activating means for admitting a working fluid into the chamber upon activation of the fluid actuator to move the piston in a direction opposite to said given direction toward the other of said first and second positions against the bias of the resilient biasing means, and for releasing the working fluid from the chamber upon deactivation of the fluid actuator to enable return of the piston in response to the bias of the resilient biasing means;

the diaphragm including a longitudinally extending salient-shaped flexible portion between the piston and the chamber wall whereby movement of the piston between the first and second positions thereof is accompanied by a rolling movement of the salient-shaped flexible portion of the diaphragm;

a further diaphragm extending between the piston and the chamber wall at said one end of the chamber, the further diaphragm having a longitudinally extending salient-shaped flexible portion between the piston and the chamber wall, whereby movement of the piston is accompanied by a rolling movement of the salient-shaped flexible portion of the further diaphragm, the total area of the piston and the first said diaphragm acted upon by the working fluid in the chamber being greater than the corresponding total area of the piston and the further diaphragm so that movement of the piston in response to the working fluid is in the direction opposite to said given direction; and

means for selectively reversing the given direction of the resilient biasing means; and

means for selectively reversing the relative location of the diaphragms so as to reverse the direction of movement of the piston in response to the working fluid in the chamber, whereby the motion transmitting member is free to move from the first location toward the second location thereof selectively in response to activation and deactivation of the fluid actuator.

4,120,322

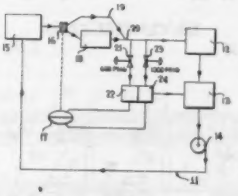
HYDRO-FLUIDIC TEMPERATURE SENSOR AND CONTROL SYSTEM

Ronald E. Bowles, 2105 Sondra Ct., Silver Spring, Md. 20904

Filed Apr. 22, 1975, Ser. No. 571,012

Int. Cl.[2] F15C *1/18*

U.S. Cl. 137—842 **6 Claims**



1. A high pressure hydraulic turbulence amplifier comprising generally coaxial and spaced power nozzle and receiving orifice separated by a reaction region, means for issuing a liquid having laminar flow characteristics from said power nozzle, across said reaction region and into said receiving orifice, said reaction region containing the same liquid as issued from said power nozzle, the density-viscosity parameters of the liquid, the liquid pressure supplied to the power nozzle and the diameter of said power nozzle being interrelated such that upon variation of said density-viscosity parameters of said liquid by a prescribed amount said laminar stream becomes turbulent in said reaction region, and means for producing turbulence of said laminar stream said last mentioned means including intersecting said laminar stream with a liquid of higher temperature in said reaction region.

4,120,323

POLYGONALLY WRAPPED SLEEVE, AND METHODS AND DEVICES FOR MAKING SAME

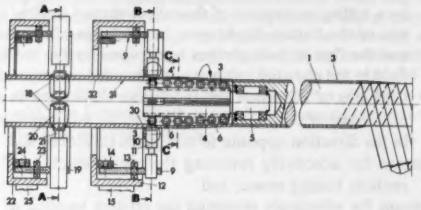
Franz J. Saul, Gürzenicher Str. 61, 5160 Düren, Germany

Filed May 20, 1975, Ser. No. 579,058

Claims priority, application Fed. Rep. of Germany, May 20, 1974, 2424413

Int. Cl.[2] F16L *11/00;* B31C *3/00;* B65H *81/00;* B65D *3/00*

U.S. Cl. 138—129 10 Claims



1. A substantially flat-sided, polygonal, tubular packaging sleeve comprising,

spirally overlayed layers of strips made from material which is selectively softenable by the application of bonding material thereto and remains softened thereby until said bonding material has set, and is susceptible to stretching deformation while in the softened state, said strips having been bonded together by a bonding material which, until is set, caused the material from which at least some of said layers are made to be softened,

said sleeve having longitudinally oriented corners between the sides thereof, each of which comprises an impressed bend in the wall of said sleeve with associated stretching deformation of at least some of the constituent layers.

4,120,324

HIGH PRESSURE HOSE COMPOSED OF ELASTOMERS AND EMBEDDED REINFORCEMENTS

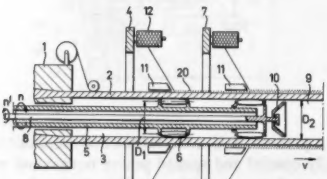
Karl Heinz Pahl, Düsseldorf-Lohausen, Germany, assignor to Pahl'sche Gummi- und Asbestgesellschaft Paguag, Düsseldorf, Germany

Continuation of Ser. No. 492,558, Jul. 29, 1974, abandoned. This application Jun. 21, 1976, Ser. No. 698,617

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1973, 2338948

Int. Cl.[2] F16L *11/00*

U.S. Cl. 138—137 11 Claims



1. A high pressure built-up multi-layer hose for use in conveying fluids therein when said hose is under high hydrostatic pressure imposed by a body of water thereabove, said hose made of multi-layers of elastomers and a plurality of layers of reinforcing inserts therein, the respective elastomer layers made of different elastomeric compounds of different permeability factors, said layers so physically disposed with relation to one another and said reinforcing layers through the thickness of the wall of the hose so as to define a wall which is permeable to some of the components being conveyed and impermeable to other components being conveyed when said hose is disposed beneath a body of water imposing said high hydrostatic pressure, said wall comprising a first inner layer of a first elastomeric compound having the lowest permeability factor, a first reinforcing layer touching and disposed over said first inner layer of elastomeric compound, a second elastomeric layer touching and disposed over said first reinforcing layer, said second elastomeric layer having a lower permeability factor than the layer disposed therebeneath, said hose having an inside diameter greater than 50 mm, a jointless length of at least 100 meters, said permeable wall having a permeability of the different layers with respect to harmful components conveyed within said hose which increases from the inside of said hose to the exterior thereof.

4,120,325

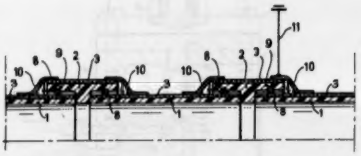
ELECTRICALLY CONDUCTING PLASTIC PIPE SYSTEM

Warner Jan de Putter, Hardenberg, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Division of Ser. No. 447,582, Mar. 4, 1974, Pat. No. 3,943,273. This application Jan. 7, 1976, Ser. No. 647,242

Int. Cl.[2] F16L *9/14*

U.S. Cl. 138—145 1 Claim



1. A polyvinylchloride pipe having an inner and outer surface characterized in that one of said surfaces is provided with a continuous coating layer of a thermosetting modified epoxy material which is fully connected with the surface of the pipe and adheres thereto, the thermosetting coating containing a quantity of soot-like conducting carbon particles so that the thermosetting coating layer is electrically conductive, the coating being connectible with means for discharging the electric charges.

4,120,326

SHED FORMING DEVICE FOR LOOMS

Ladislav Bezstarosti; Josef Lzicar; Jiri Lanta, all of Usti nad Orlici, and Vladimir Kriz, Brno, all of Czechoslovakia, assignors to Vyzkumny ustav bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Sep. 27, 1976, Ser. No. 726,491

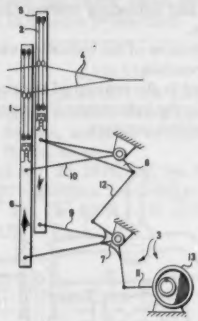
Claims priority, application Czechoslovakia, Oct. 3, 1975, 6699-75

Int. Cl.[2] D03C *13/00, 9/06;* D03D *47/26*

U.S. Cl. 139—55.1 14 Claims

1. In a travelling-wave shedding loom having a shed forming device comprising heald holders arranged side-by-side in arrays across the warp sheet, and a mechanism for reciprocating and controlling the heald holders, the improvement wherein the upper portion of each holder supports the healds and the lower portion of each holder is drivingly connected with the heald reciprocating mechanism, each said heald holder comprising two separate members which are connected to each other in the loom, a lock for selectively connecting the two members of the holder, said lock comprising one portion of one

member of the holder which is formed so that one end thereof may be telescoped into a mating portion of the other member,



and a pawl for selectively holding the members in telescoped connected position.

4,120,327

DOUBLE-LIFT DOBBY

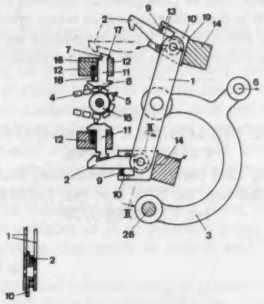
Rudolf Schwarz, Horgen, Switzerland, assignor to Staeubli Ltd., Switzerland

Filed May 25, 1977, Ser. No. 800,286

Claims priority, application Switzerland, May 28, 1976, 6745/76

Int. Cl.[2] D03C *1/06*

U.S. Cl. 139—71 **5 Claims**



1. In a negative double-lift dobby comprising an information containing pattern card, a baulk. draw hooks mounted at opposite ends of said baulk, a jack-lever pivotally connected to a mid-section of said baulk, control means for cyclically oscillating said baulk and holding hook members and support means therefor supporting said holding hook members for movement into and out of the path of movement of said draw hooks, the improvement comprising wherein said support means is a guideway in a stationary bar, wherein said holding hook members are reciprocally slidably supported in said guideway between opposite first and second limit positions, said holding hook members each having a holding hook thereon and selectively controlled means remote from said holding hook responsive to said information embodied on said pattern card for effecting a sliding movement of said holding hook member in said guideway between said first and second limit positions, each of said holding hooks being positioned in the path of movement of said draw hooks when in one of said first and second limit positions, and resilient means for effecting a yielding of the position of at least one of said draw hook and said holding hook to facilitate the passage of said draw hook past said holding hook when said holding hook is in said one of said first and second limit positions.

4,120,328

SHUTTLE CONSTRUCTION

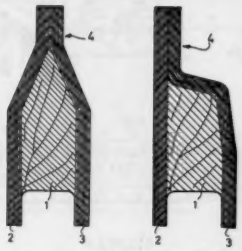
Louis Rosenast, Wald, Switzerland, assignor to Ruti Machinery Works Ltd., Ruti, Switzerland

Filed Aug. 15, 1977, Ser. No. 824,781

Claims priority, application Switzerland, Aug. 23, 1976, 10647/76

Int. Cl.[2] D03J *5/02*

U.S. Cl. 139—196.1 **3 Claims**



1. Shuttle construction for a weaving machine having a center piece and a cover formed from resin-impregnated fabric webs surrounding the center piece, characterized by the fact that the cover consists of two parts each having inner and outer surfaces, each part extending in the longitudinal direction and forming a wall of the shuttle, and which parts come together and overlie each other along a portion of their inner surfaces to form an overlap in the region of the tip of the shuttle.

4,120,329

GRIPPER SHUTTLE FOR PICKING IN WEAVING MACHINES

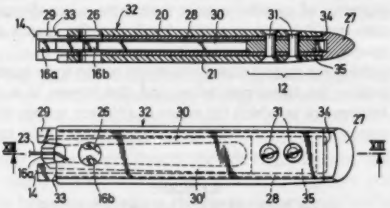
Otto Hintsch, Wallisellen, Switzerland, and Rudolf Stauner, Konstanz, Germany, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Aug. 19, 1977, Ser. No. 826,233

Claims priority, application Switzerland, Aug. 24, 1976, 10712/76

Int. Cl.[2] D03J *5/06*

U.S. Cl. 139—196.2 **25 Claims**



1. A gripper shuttle for picking in a weaving machine comprising

a metal inner part having a pair of opposed external surfaces;

a plastics sleeve disposed about said metal inner part in locked relation and having a pair of opposed wide sidewalls bearing substantially throughout the entire length thereof on said external surfaces of said inner part and a pair of opposed narrow sidewalls, said wide sidewalls having outer sliding surfaces for sliding on a series of guide teeth during picking and for engagement by a catcher during braking; and

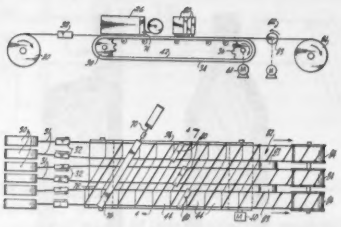
a yarn clamp having a pair of resilient arms disposed within said inner part for engaging a yarn.

4,120,330

METHOD FOR MANUFACTURING A WIRE MATRIX

Victor P. Weismann, 430 Prospect Cir., South Pasadena, Calif. 91030

Division of Ser. No. 646,607, Jan. 5, 1976, abandoned. This application May 6, 1977, Ser. No. 794,376
Int. Cl.[2] B21F *15/02, 21/10*
U.S. Cl. 140—112 1 Claim



1. The method of making a three-dimensional wire matrix composed of a plurality of wire trusses comprising the steps of:

feeding a plurality of truss longitudinal runner wires along parallel paths in a common plane with the spacing between adjacent wires of each pair being substantially less than the spacing between the wires of each pair,

laying a plurality of spaced parallel truss strut cross-wires against the runner wires, each of the cross-wires bridging all of the runner wires and being disposed diagonally relative to the runner wires,

securing each of the cross-wires to the runner wires at the points of intersection to form a two-dimensional wire grid,

cutting each of the cross-wires after it is secured to the runner wires between each adjacent pair of runner wires to form a plurality of separate trusses each of which has parallel struts disposed diagonally between and connected to two parallel longitudinal truss runners,

twisting each of the separate trusses about its length through an angle of 90° so that the plane defined by the struts and runners of each truss is parallel to the corresponding plane of the other trusses, adjacent trusses being twisted in opposite rotary directions,

contacting both of the longitudinal runner wires of each of the separate trusses at spaced locations therealong by a plurality of parallel matrix transverse wires disposed in two parallel planes perpendicular to the planes of the trusses, and

attaching the matrix transverse wires to the truss runners to secure the transverse wires and the trusses in a matrix framework in which the struts in adjacent trusses slope in opposite directions relative to the runners of the trusses.

4,120,331

LOW PRESSURE GAS REGULATOR

Charles S. Krivanek, III, 2443 Vauxhall Rd., Union, N.J. 07083

Filed May 11, 1977, Ser. No. 796,028
Int. Cl.[2] B08B *9/08;* F16K *9/00*
U.S. Cl. 141—66 8 Claims

1. A low pressure gas regulator for purging vessels comprising:

(a) an outlet-conduit for gas,

(b) an intake-conduit for gas,

(c) an exhaust-conduit for gas,

(d) a first valve means having passages therein alternatively connecting the intake and exhaust conduits to the outlet conduit,

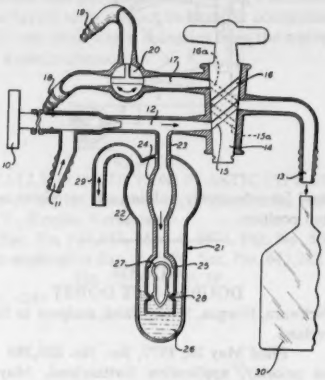
(e) an indicating valve connected to the intake conduit for receiving at least part of the gas from the intake conduit,

(f) a conduit in the indicating valve communicating with the intake conduit and extending toward the bottom of the indicating valve.

(g) a liquid at the bottom of the indicating valve covering the bottom of the conduit,

(h) a float captured in the bottom of the conduit,

(i) a vent passage in the indicating valve opening the indicating valve to ambient pressure,



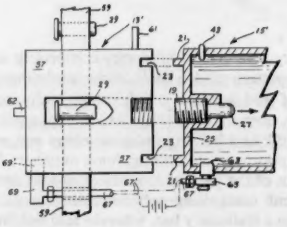
(j) the float functioning as a check valve in response to the liquid level in the conduit to block the passage of gaseous material up the conduit in the indicating valve, and into the intake conduit when the liquid rises in the conduit when closed, and to pass gaseous material down through the conduit in the indicating valve when open; the passage of bubbles through the liquid providing an indication of the pressure condition in the intake conduit for gas.

4,120,332

AUTOMATIC DETACHABLE CHARGING HEAD FOR PRESSURE TANK

Elisha C. Davis, 1344 Davis Ave., Enumclaw, Wash. 98022

Filed Sep. 16, 1976, Ser. No. 724,051
Int. Cl.[2] B65B *3/26*
U.S. Cl. 141—197 3 Claims



1. In combination, a detachable charging head and pressure tank having a check valve in operative communication with the charging head to allow gases therefrom to flow into the tank and a safety pressure release mechanism to prevent overpressurization, said detachable charging head comprising a charging cartridge containing a combustionable material suitable for producing gases positioned in the central area of said charging head, means for threadably attaching said charging head to said pressure tank, means for axially aligning said charging head and said pressure tank, and means for filling the pressure tank by firing said charging cartridge including an automatic charging head comprising a firing breech with a

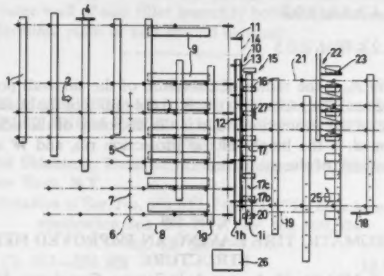
trigger attached thereto, a feed belt for supplying charging cartridges to said firing breech, and a cocking bolt on said firing breech for setting the trigger in position for firing to force gases through the check valve into the tank thereby causing the tank to become pressurized.

4,120,333

METHOD AND APPARATUS FOR TRIMMING TIMBER

Hans Arthur Hellgren, and Karl Georg Erhard Marklund, both of Skelleftea, Sweden, assignors to Renholmens Mekaniska Verkstad AB, Byske, Sweden

Filed Apr. 27, 1976, Ser. No. 680,802
Claims priority, application Sweden, Apr. 28, 1975, 7504907
Int. Cl.[2] B27B *1/00, 31/04*
U.S. Cl. 144—312 **5 Claims**



1. In a method of trimming timber pieces moving at spaced intervals and perpendicularly to their longitudinal direction to facilitate length and quality determination of said pieces in order to obtain optimal yield from each timber piece, comprising the steps of:

(a) trimming first ends of said pieces during said movement;

(b) advancing said pieces to a turnover mechanism;

(c) applying on the lower surface of each one of said timber pieces a plurality of marks equally spaced relative to each other over a substantial length of each piece incorporating the second transverse end thereof, each one of said marks being located at a distance from said first trimmed end which is a multiple of the spacing between the marks;

(d) turning said piece in said turnover mechanism to make said marks visible from above said piece, inspecting all of the piece surfaces so as to properly grade the piece and then selecting that mark at which said piece is to be trimmed off;

(e) positioning said selected mark in registry with a saw line parallel with the advancing direction of the pieces for a second trimming saw, by moving said piece in its longitudinal direction; and

(f) advancing said piece to said second trimming saw to cut off the piece at the selected mark.

4,120,334

ONE OPERATOR SHAKE SPLITTING APPARATUS

John H. Hughes, Aberdeen, Wash., assignor to J. H. Hughes, Inc., Montesano, Wash.

Filed Feb. 22, 1977, Ser. No. 770,567
Int. Cl.[2] B27L *7/00*
U.S. Cl. 144—326 R **11 Claims**

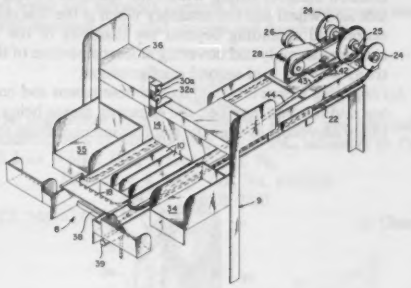
1. A shake splitting apparatus for splitting shakes from a pre-kerfed shake block comprising:

a block support surface,

means on said support surface for blocking movement of the block along the support surface,

splitting means having a forward end for slicing into the inner end of a kerf in a block resting on the surface against the blocking means, and

means for pulling said splitting means toward said blocking means for splitting a shake free of said block, said pulling means including flexible tension means coupled to said forward end of the splitting means and positioned below said forward end whereby the forward end of the splitting



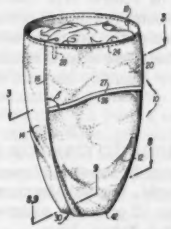
means applies both a splitting force and a downward force for holding the block on the support surface during splitting.

4,120,335

LAUNDRY BAG

Winalee G. Mitchell, c/o Principle Business Enterprises Inc., Pine Lake Industrial Park, Dunbridge, Ohio 43414

Continuation-in-part of Ser. No. 700,262, Jun. 28, 1976, abandoned. This application Apr. 8, 1977, Ser. No. 785,975
Int. Cl.[2] B65D *29/00*
U.S. Cl. 150—7 **8 Claims**



1. In a bag which includes a wall portion and a flap secured to the upper portion of said wall portion, said flap having a bag-open position in which said flap forms a pocket with a downwardly directed mouth to receive a means for supporting said bag, and a bag-closed position in which said pocket has been pushed inside out and slipped over an opening in the top of the bag, said flap being attached to opposite sides of the wall portion by a pair of upstanding seams, with which the lower edge of said flap intersects, the improvement characterized in that said flap, when laid flat in an unstretched condition, is narrower at the center than at the side edges thereof, and said lower edge, viewed with the flap in both the bag-open position and the bag-closed position, intersects with each of said seams at an acute angle, said flap being otherwise free of seams which intersect with said lower edge.

4,120,336

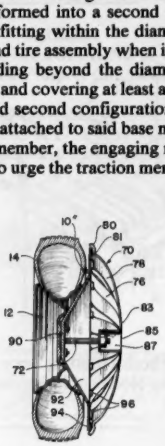
TRACTION DEVICE FOR POWER DRIVEN VEHICLES

William C. Baskall, 10520 Pierson Cir., Broomfield, Colo. 80020

Filed Sep. 27, 1976, Ser. No. 727,224
Int. Cl.[2] B60C *27/02*
U.S. Cl. 152—216 **4 Claims**

1. A traction device for use on a vehicle having a wheel and tire assembly connected to the vehicle, comprising:

(a) base means connectable to said wheel and tire assembly;
(b) a traction member connected to said base means having a predetermined first configuration and being flexible enough to be deformed into a second configuration, the traction member fitting within the diameter of and along side said wheel and tire assembly when in the first configuration and extending beyond the diameter of the wheel and tire assembly and covering at least a portion of the tire tread when in said second configuration;
(c) engaging means attached to said base means and contacting said traction member, the engaging means being selectively moveable to urge the traction member from the first



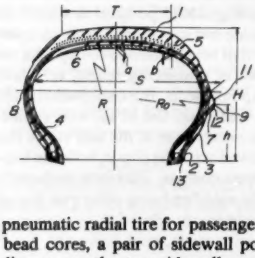
configuration into the second configuration or to release the traction member from the second configuration, the engaging means comprising a shaft perpendicularly attached to said base means and an adjusting member axially moveable thereon;
(d) the traction member comprising a dome-shaped member having its concave side facing the tire and wheel assembly and having its central area attached to said adjusting member, the outer rim of said dome-shaped member covering a portion of the tire tread when the adjusting member moves the dome-shaped member axially toward the tire and wheel assembly into said second configuration.

4,120,337

SAFETY PNEUMATIC TIRE FOR PASSENGER CARS

Akio Soma, Musashi-Murayama; Haruro Kawashima, Kodaira; Makoto Yamauchi, Higashi-Murayama, and Shoji Tanaka, Higashi-Yamato, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Apr. 12, 1977, Ser. No. 786,933
Claims priority, application Japan, Apr. 16, 1976, 51-43413
Int. Cl.[2] B60C *13/00*
U.S. Cl. 152—353 R **5 Claims**



1. A safety pneumatic radial tire for passenger cars comprising a pair of bead cores, a pair of sidewall portions, a tread portion extending across the two sidewall portions in a ratio R/S of 1.2/1 to 2.5/1, where R is the curvature of the inner surface of the tread portion and S is the maximum width of the tire exclusive of any protection rib, at least one carcass ply containing cords embedded therein and extending across the two bead cores in a substantially radial direction, a belt reinforcing layer arranged between the carcass ply and the tread portion, a viscous rubber puncture-sealing layer arranged on the inner circumferential surface of the tread portion, an annular protection rib on at least one side of the sidewall portions and coaxial therewith, said protection rib having a substantially trapezoidal cross-sectional shape, the vertical height of the middle position of the outer end and inner end of the protection rib from the bead base portion being positioned less than at the maximum width position of the tire therefrom but being at least 35% of the height of the cross-section of the tire, a first concaved surface having a radius of R_1, which extends from the outer end of the protection rib towards the tread portion, a second concaved surface having a radius of R_2, which extends from the inner end of the protection rib towards the bead portion, and said radii being in a relation of $R_1 > R_2$, and the cross-sectional shape of the protection rib being defined by the following formulae:

$$3.0R_0 > R_1 > 0.5R_0$$

$$1.4 \geqq d_1/d \geqq 0.7 \quad \text{and}$$

$$1.2 \geqq W/d_1 \geqq 0.5$$

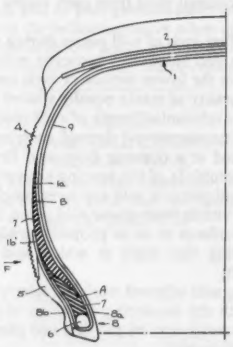
wherein R_0 is the radius of curvature of the sidewall portion located near the protection rib, R_1 is the radius of the concaved surface of the protection rib, d is the thickness of the sidewall portion, d_1 is the height of the protection rib, and W is the upper width of the protection rib.

4,120,338

PNEUMATIC TIRE HAVING AN IMPROVED HEEL STRUCTURE

Henri J. Mirtain, 35, Avenue de la Somme, Compiegne, France

Filed Oct. 4, 1976, Ser. No. 729,456
Int. Cl.[2] B60C *15/04*
U.S. Cl. 152—354 R **15 Claims**



1. A pneumatic tire having, in cross-section, an inner wall portion and an outer wall portion, a bead core disposed between said inner and outer wall portions, a carcass disposed between said inner and outer wall portions, a tread defining a tread region and forming a crown-like cover on the carcass, and a rubber filler assembly disposed between said inner and outer wall portions, said filler assembly having a base portion at the bead core and extending toward the tread between said inner and outer wall portions, said filler assembly including an inner and outer wall portion corresponding to the inner and outer wall portions of said tire and being of generally decreasing thickness from said bead core as it extends toward said tread and having not more than two filler elements consisting of a first element of reinforced stranded rubber with a Shore A hardness in the order of 85° to 93° and a second element of nonreinforced rubber with a Shore A hardness in the order of 70° to 95°, the first and second elements being in mutual contact at an oblique angle with the equatorial plane of the tire, such that said first element incorporates all of said base portion and is of generally decreasing thickness in a direction from the

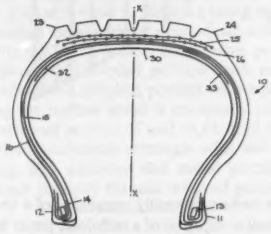
bead core toward the tread, and said second element is disposed remote from said bead core and is of generally increasing thickness in said direction up to a point of maximum thickness and then of generally decreasing thickness in said direction to a terminal point at a predetermined distance from said bead core, said carcass having a first ply portion passing from said tread region along the inner wall side of said rubber filler assembly in substantially continuous contact with the inner wall side of said rubber filler assembly from the terminal point of said second element to the base portion of said first element and is folded about the bead core to form a turnup at the outer wall portion of said filler assembly extending toward said tread, and terminating before the terminal point of said second element said turnup being in substantially continuous contact with the outer wall portion of said filler assembly, said tire further including a second ply having a portion overlapping the outer wall of said filler assembly between said turnup and the terminal point of said second element.

4,120,339

PNEUMATIC TIRE HAVING CARCASS CORDS WHICH DEPART FROM THE RADIAL PLANE IN THE TREAD REGION

Daniel Shichman, Trumbull, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Continuation of Ser. No. 648,617, Jan. 12, 1976, abandoned. This application Jun. 24, 1977, Ser. No. 809,594
Int. Cl.[2] B60C *9/10*
U.S. Cl. 152—354 RB **13 Claims**



1. A pneumatic tire having tread and sidewall portions and a shoulder region comprising:

a carcass comprising two beads and at least one ply of cords extending from bead to bead, the shortest line along said carcass from the end region of a given cord of said ply at one bead to the end region of said given cord at the other bead being a line lying in a plane in the range of 0° to 5° from a radial plane of the tire, said end regions of said given cord at both beads being substantially equally spaced from said radial plane;

said carcass cords intersecting the shortest lines along said carcass between the end regions of said cords at said one bead to the end regions of said cords at said other bead, the intersections occurring at said end regions of said cords and at a point therebetween, said carcass cords having a slope departing gradually from the slope of said shortest lines, the maximum angular departure of said slope of said carcass cords of said one ply from said slope of said shortest lines between said end regions of said cords of said one ply being at least 10° averaged over a substantial length of said cords of said one ply;

one or more breaker ply plies of cords extending continuously over said carcass plies from shoulder region to shoulder region of the tire and each having two circumferential edges and each having a cord angle averaged over a region extending a substantial distance on each side of the equator of the tire in the range of 12° to less than 20° with respect to said equator and having a cord angle averaged over a substantial distance at said edges of said breaker ply which is higher than said average breaker cord angle on each side of said equator;

all breaker plies of cords of the tire having cord angles displaced from 0°;

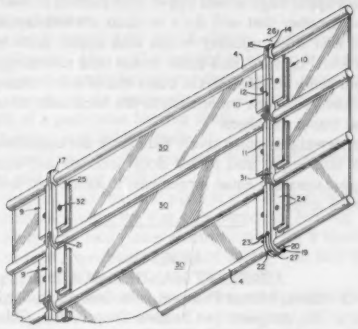
said tread and sidewall portions being of elastomeric material disposed over said carcass and breaker plies.

4,120,340

CLOSURE

John A. Stascavage, Exeter; William W. Rawls, and Alexander Buchholz, both of Mountaintop, all of Pa., assignors to Cornell Iron Works, Inc., Mountaintop, Pa.

Filed Nov. 8, 1977, Ser. No. 850,089
Int. Cl.[2] E06B *9/08*
U.S. Cl. 160—133 **15 Claims**



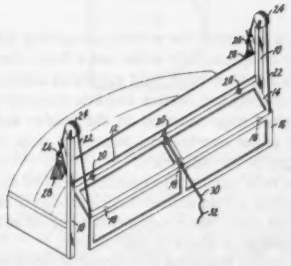
1. A displaceable grille closure including, a plurality of parallel spaced apart rods, at leasttwo series of link assemblies joined to and maintaining said rods in said parallel relationship, each said series including a plurality of similar and axially aligned link assemblies, each said assembly having a tongue and a groove at opposite axial ends thereof and each provided with a transverse opening therethrough, said openings of said tongue and groove of adjacent said assemblies intermeshed and journaled about a common one of said rods, attachment means on each side of each said assembly and a panel having oposite end edges respectively connected to said attachment means of two laterally adjacent assemblies of said two series.

4,120,341

GREENHOUSE DOOR ASSEMBLY

John Peter Doering, Salinas, Calif., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sep. 7, 1977, Ser. No. 831,073
Int. Cl.[2] E05D *15/26*
U.S. Cl. 160—213 **9 Claims**



1. A door assembly suitable for relatively large openings such as an entire greenhouse end and movable between a

closed position and an upper open position disposed above the door opening and clear of said opening, comprising:

spaced apart vertical side frame members and a top horizontal frame member defining said door opening, said side frame members extending substantially above said horizontal frame member,

upper and lower door sections controlling said door opening, said sections being pivotally connected along their adjacent edges and the upper edge of said upper door section being pivotally attached to said horizontal frame member,

cable means attached to upper door section on either side at points proximate to its edge connected to said lower door section, and extending upward to and passing over a pulley means affixed to said vertical side frame members at a height sufficiently above the point of attachment of said upper edge of said upper door section to said horizontal member that said door sections are substantially clear of said door opening when said upper door section is pivoted upward, said cable means then extending down to and being attached to the outer end of lever arms pivotally attached at their inner ends to the back sides of said vertical frame members,

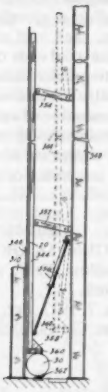
counterweights collectively balancing the combined weight of said upper and lower door sections and attached in approximately equal increments to said outer ends of said lever arms.

4,120,342

AIRCRAFT HANGER DOOR

Kelly D. Mama, Mount Prospect, and Otto C. Roller, Chicago, both of Ill., assignors to Channon Corporation, Chicago, Ill.

Filed Dec. 17, 1976, Ser. No. 751,809
Int. Cl.[2] A47G 5/02; E06B 9/20
U.S. Cl. 160—310 **11 Claims**



1. A closure apparatus for a vertical-opening defined by a header, a pair of spaced side walls and a floor, the side walls each having a marginal edge, said apparatus comprising:

a curtain including top, bottom and side marginal edges, said top marginal edge attached to the header and said side marginal edges overlapping respective ones of the marginal edges of the side walls;

an elongate tube having a longitudinal axis of rotation, said tube attached to said bottom marginal edge of said curtain;

vertical guide track means supported adjacent at least one of the side marginal edges of said curtain;

tube guide means engaging and movable along said vertical guide track means;

control means including motor means connected to said tube and to said tube guide means for rotating said tube in one direction to roll up said curtain and in the opposite direction to pay out said curtain; and

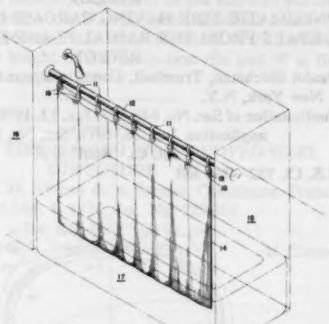
side seal means including a pair of resilient members carried on respective ones of the marginal edges of the side walls and a pair of parallelogram structures disposed adjacent respective ones of the side walls, each of said parallelogram structures including a fixed member and a movable member parallel to and pivotally connected to said fixed member and movable to clamp the respective marginal edge of said curtain against the respective resilient member.

4,120,343

DISPOSABLE SHOWER CURTAIN ENSEMBLE

Eunice D. Wilson, 2504 Tonoka Rd., Richmond, Va. 23223

Filed Sep. 6, 1977, Ser. No. 831,029
Int. Cl.[2] A47H 1/00; A47K 3/14
U.S. Cl. 160—330 **1 Claim**



1. A shower curtain assembly consisting of a flexible opaque rectangular sheet comprised of a cellulosic paper having a basis weight between 50 and 400 grams per square meter, at least one surface of said paper being covered by an adherent layer of water-resistant organic polymer material, said sheet containing adjacent its upper edge a uniformly spaced series of holes, and flexible strap members having an elongated configuration terminating in anchor ends having an area of between ½ to 3 square inches attached by contact-type adhesive to opposed sides of said sheet in a manner occluding a hole and providing direct adhesive bonding across the area of said hole, each of said strap members thereby forming a closed loop disposed above said upper edge, and adapted to engage an overhead support rod, said sheet having been deployed from a compactly folded state having initially formed folds in the vertical direction representing pleated folds, and subsequently formed folds in the horizontal direction.

4,120,344

METHOD OF CONTINUOUS CASTING TELLURIUM CONTAINING STEELS

Arthur C. Borg, Calumet City, and Alex Zletz, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jul. 20, 1977, Ser. No. 817,143
Int. Cl.[2] B22D 11/00
U.S. Cl. 164—73 **4 Claims**

1. In a process of continuous casting of tellurium steel, which includes pouring tellurium steel into a mold to form a cast and lubricating the interface between the mold and said tellurium steel, the improvement comprises lubricating said interface

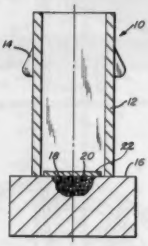
with a composition consisting essentially of a white petroleum mineral oil.

4,120,345

METHOD FOR INGOT MOLD REPAIR

Robert R. Strange, Northfield, Ohio, and James M. Zimmer, Brighton Township, Beaver County, Pa., assignors to Crucible Inc, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 784,769, Apr. 5, 1977, abandoned. This application Nov. 3, 1977, Ser. No. 848,046
Int. Cl.[2] B22D *7/06, 19/10*
U.S. Cl. 164—92 5 Claims



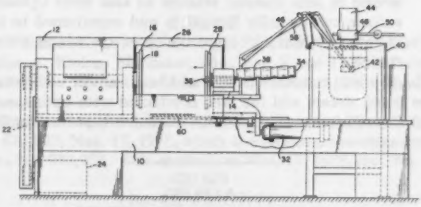
1. In a method for ingot casting using a vertical mold having a mold bottom with a relieved portion produced by erosion during casting, which method includes the steps of casting molten metal into said mold to form a casting upon solidification of said molten metal and removal of said solidified casting from said mold, the improvement comprising, prior to casting, essentially filling said relieved portion with metal particles only and covering said relieved portion with a plate, whereby during casting the molten metal is essentially prevented from entering the relieved portion of said mold stool and said metal particles do not significantly comingle with said molten metal during casting, and whereby said metal particles sinter together to at least partially fill said relieved portion.

4,120,346

AUTOMATIC CENTRIFUGAL BABBITTING APPARATUS AND METHOD

Thomas A. Teager, Natick, Mass., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 4, 1977, Ser. No. 793,580
Int. Cl.[2] B22D *19/08*
U.S. Cl. 164—105 6 Claims



1. Apparatus for applying babbitting material to a cylindrical bearing shell, comprising:

a first rotatable end plate including a sealing face thereon against which the outer marginal portion of one open end of said bearing shell is received and sealed;

a spaced apart, opposite end plate assembly including a rotatable end plate having a sealing face thereon against which the outer marginal portion of the other open end of said bearing is received and sealed;

openable housing means generally enclosing the space in which the bearing shell is received between said plates for babbitting;

means moving said opposite end plate assembly between one position clamping said shell between said end plates in a sealing relation, and other positions for releasing said shell after babbitting;

an upwardly-open, inclined babbitt-receiving trough carried by said opposite end plate assembly and including conduit means connecting the lower end of said trough to a location between said end plates and corresponding to the interior space of a bearing shell when the shell is in position for babbitting;

a stationary, molten babbitt tank adjacent said opposite end plate assembly;

a molten babbitt pump immersed in said tank at an intermediate level;

an electric motor mounted above said tank and connected to drive said pump;

pipe means connected to the discharge of said pump and extending to a pipe outlet located to overlie the open top side of said trough throughout the range of movement of said trough in its positioning in accordance with the length of a particular bearing shell;

means heating said babbitt tank;

means admitting a coolant into said housing for circulation about said bearing shell;

means rotating said first end plate at a predetermined speed in accordance with the size of a particular bearing;

means energizing said pump electric motor for a controlled time to feed a specified volume of babbitt into said trough in a continuous uninterrupted flow; and

a control system including switch means and timer means actuating and deactuating in a predetermined sequence and for preselected times the rotating means for the first end plate, the coolant circulating means, and the molten babbitt pump motor;

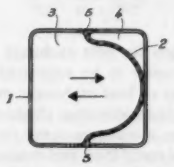
said predetermined sequence including first actuating said end plate rotating means, then said coolant admission means, and then said molten babbitt pump motor, and then deactuating first said molten babbitt pump motor and thereafter said coolant circulating means, and said end plate rotating means.

4,120,347

TWO-PASSAGE PIPE, ESPECIALLY FOR AIR CONDITIONING INSTALLATIONS

Imre Molnar, Am Haushof 5, 4005 Meerbusch 1, Fed. Rep. of Germany

Filed Oct. 4, 1976, Ser. No. 729,147
Int. Cl.[2] F25B *29/00*
U.S. Cl. 165—48 R 3 Claims



3. In combination in an air conditioning installation: an air conditioning device having an air inlet and an air outlet, a plurality of rooms to be air conditioned having inlet means for admitting conditioned air and also having outlet means for discharging air to be re-conditioned, first conduit means establishing communication between said outlet means of said rooms and said inlet of said air conditioning device, second conduit means connected to said outlet of said air conditioning device and branching out into a first branch and a second branch, post-heater means having an air inlet communicating

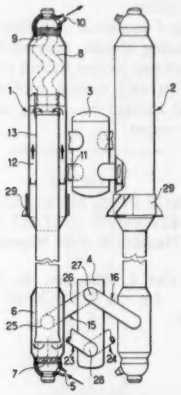
with said first branch and also having an outlet, cooler means having an inlet communicating with said second branch and also having an outlet, conveying means comprising a pipe and a flexible air impermeable diaphragm fastened to said pipe along diametrically oppositely located sections of said pipe, said sections extending over the length of said pipe and being located substantially along a central longitudinal plane of said pipe thereby dividing said pipe into two adjoining passages arranged alongside each other, said diagphragm being in a position to vary flow quantity through said adjoining passages alternately between essentially 0% and 100% of the collective flow quantity possible through the two passages in said pipe, said two passages respectively communicating with said outlet of said post-heater means and said cooler means for respectively conveying cooled and heated air to said inlet means of said rooms, and mixing means interposed between said conveying means and said rooms for respectively admixing cold and warm air to the air respectively passing through said two passages to said air in said passages prior reaching said rooms.

4,120,348

HEAT EXCHANGER HAVING A PLURALITY OF MODULES CONNECTED IN PARALLEL

Pierre Pouderoux, Meudon, France, assignor to Stein Industrie S.A., Valizy-Villacoublay, France

Filed Dec. 10, 1976, Ser. No. 749,260
Claims priority, application France, Dec. 18, 1975, 75 38834
Int. Cl.[2] F28F *7/00*
U.S. Cl. 165—81 **2 Claims**



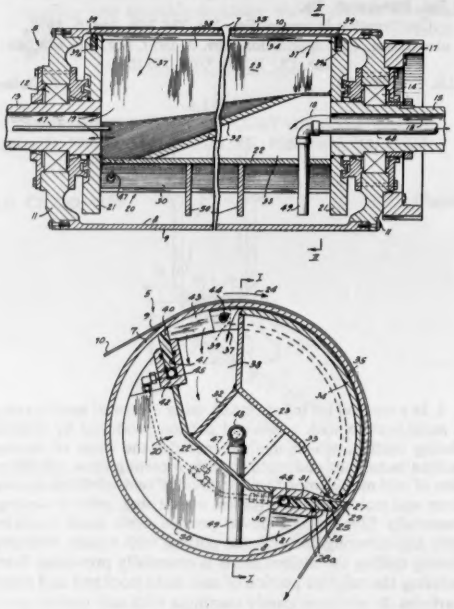
1. A heat exchanger for heat exchange between a molten alkaline metal and water to be vaporized and superheated, employing a plurality of heat exchanger modules; a common feed vessel for receiving said molten alkaline metal for distribution to said modules; a common sump for recycling cooled molten alkaline metal metal from said modules; said feed vessel being disposed above said sump and said heat exchanger modules being formed of generally vertically oriented elongated members disposed around said feed vessel and sump, wherein: said feed vessel being connected to said heat exchanger modules by short straight collectors, and said sump being connected to said modules by generally U-shaped collectors having respective inputs and outputs at different levels whereby said sump collectors being formed to have sufficient resilience for expansion of a heat exchanger module in the event of accidental reaction between said alkaline metal and cooling fluid of said heat exchanger.

4,120,349

HEAT TRANSFER ROLL

Robert J. Alheid, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Oct. 12, 1976, Ser. No. 731,433
Int. Cl.[2] F28D *11/02*
U.S. Cl. 165—89 **12 Claims**



1. A hollow rotary heat transfer roll having a cylindrical heat transfer wall providing an inner cylindrical surface and an outer cylindrical periphery, on a substantial width and limited length circumferential segmental area of which a web is adapted to travel in heat transfer relation, comprising in combination:

means for circulating a heat transfer liquid through the interior of said roll;

and means within the roll for controlling the liquid to flow counter to the direction of rotation of the roll and in a substantially uniform and unbroken thin sheet-like layer stream in heat transfer relation to said inner cylindrical surface substantially limited to and constrained to be in alignment with said segmental area on which the web travels;

whereby heat transfer through said heat transfer wall between the liquid stream and the web is effected with optimum heat transfer efficiency attained with minimum heat transfer liquid flow rate.

4,120,350

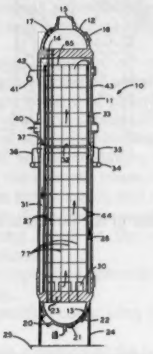
TUBE SUPPORT STRUCTURE

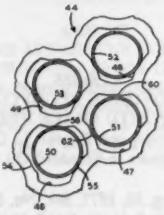
Frank E. Norton, York, Pa., assignor to The Babcock & Wilcox Company, New York, N.Y.

Division of Ser. No. 559,861, Mar. 19, 1975, and Ser. No. 175,600, Aug. 27, 1971, abandoned. This application Jul. 6, 1976, Ser. No. 702,550
Int. Cl.[2] F28F *1/00*; F28D *7/00*
U.S. Cl. 165—162 **3 Claims**

1. In a heat exchanger tube and shell structure, a generally flat plate having a plurality of individual tube receiving apertures formed therein, at least three members, integral with said

plate defining said apertures said integral members protruding inwardly toward the center of said respective apertures wherein the improvement comprises, the inwardmost end of each of said members terminating on an arc that defines a circle having a diameter which is slightly greater than the outside diameter of the individual tube that is to be received within said respective apertures, said members further forming bights between at least adjacent pairs of said members in order to provide a predetermined flow area when the tube that is individual to the respective aperture is lodged in place said inwardly extending members have sides that establish the deepest portions of said bights formed between adjacent member pairs, said deepest bight portions each defining a circle that has a larger diameter than the circle defined by said inwardmost member ends and said deepest bight portions being located on a circle having a center that substantially coincides with the center of said circle that is defined by said inwardmost member ends.





4,120,351

HEAT EXCHANGE PANEL WITH IMPROVED HEADER

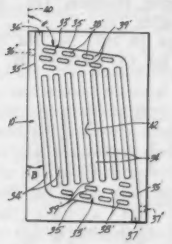
Charles A. Kleine, Florissant, Mo., and Verne L. Middleton, East Alton, Ill., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 573,953, May 2, 1975, and Ser. No. 632,502, Nov. 17, 1975, which is a continuation-in-part of Ser. No. 573,953,. This application Nov. 17, 1975, Ser. No. 632,643

Int. Cl.[2] F28F *3/14*

U.S. Cl. 165—170 **13 Claims**

1. A heat exchange panel for use in a solar energy collector system possessing a system of internal tubular passageways defining opposed headers, said headers connected by a plurality of spaced parallel individual connecting portions of said passageways extending therebetween, said headers having entry and exit portions extending therefrom to opposed edges of said panel to provide ingress and egress openings for said heat exchange medium, each of said entry and said exit portions having a central axis, said headers possessing outer boundaries defining the perimeter thereof, at least one of said boundaries lying adjacent the apex of said perimeter defining an external angel of at least 91° with respect to the central axis of the most adjacent entry or exit portions, said angle taken in the plane containing said panel, wherein said headers are triangular in shape and possess a plurality of parallel fluid channels communicating with the connecting portions of said passageways and running in a direction substantially transverse thereto wherein said parallel channels are defined by a plurality of aligned bonded portions located within said headers assisting in the distribution of said heat exchange medium to the respective connecting portions and wherein said connecting portions are disposed at an angle of at least 1° with respect to an extended straight line of the central axis of the most adjacent exit or entry portion extrapolated through said more adjacent exit or entry portion.



4,120,352

DEVICE FOR CONNECTING EXCHANGER TUBES TO PERFORATED PLATES

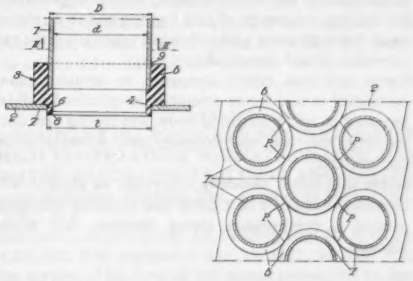
Jean Husson, Louviers, France, assignor to S.E.R.A. Husson Societe d'Etudes et Realisations Aerodynamiques, Paris, France

Filed Dec. 6, 1976, Ser. No. 747,737

Claims priority, application France, Dec. 5, 1975, 75 37533

Int. Cl.[2] F28F *9/06*

U.S. Cl. 165—173 **3 Claims**



1. In a device wherein n rings of resilient material connect in tight sealing relationship a bundle of n parallel tubes of inside diameter d and outside diameter D in a heat exchanger to the edges of n holes in a rigid plate,

the improvement comprising the diameter t of the holes being substantially equal to D and the rings having in axial half-section the shape of a flattened Z and comprising a plurality of cylindrical sleeves party enclosing one another, each sleeve including a first sleeve of inside diameter d and outside diameter t whose ends are respectively sealingly received in a hole of the plate and in axial abutment with the end of a tube, and a second sleeve of inside diameter D whose ends are respectively in sealing contact with the exterior of a tube end and in abutment with the

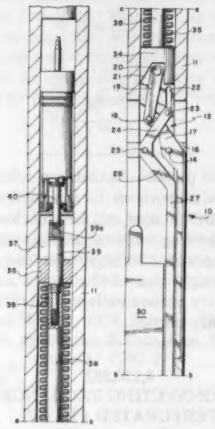
edge of a hole, the second sleeves of the rings bearing laterally against one another.

4,120,353

DEVICE TO MOVE DENSITY LOGGING TOOL AGAINST WELL WALL

Raymond Earl Roesner, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 19, 1977, Ser. No. 788,956
Int. Cl.[2] E21B *47/08*
U.S. Cl. 166—65 R **3 Claims**



1. In a wellbore logging instrument having a pivotal decentralizing arm and a borewall engaging logging pad connected to an elongated body member, with an actuator motor assembly for pivoting the decentralizing arm inward and outwards from the body, the improvement comprising:

linkage means connecting said decentralizing arm and said logging pad to said motor assembly and having cam means for limiting movement of said logging pad to a relatively small radial distance while allowing relatively great radial extension of said decentralizing arm;

wherein said cam means comprises an actuator plunger connected to said motor assembly, longitudinally slidably mounted in said enlongated body, and having said decentralizing arm and said logging pad movably secured thereto; and,

wherein said motor assembly comprises an electric motor operably connected to a drive link assembly arranged to control a compression spring abutting said actuator plunger.

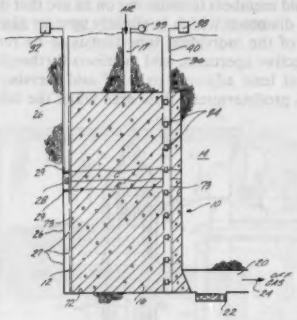
4,120,354

DETERMINING THE LOCUS OF A PROCESSING ZONE IN AN IN SITU OIL SHALE RETORT BY PRESSURE MONITORING

Richard D. Ridley, and Robert S. Burton, III, both of Grand Junction, Colo., assignors to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Jun. 3, 1977, Ser. No. 803,363
Int. Cl.[2] E21B *43/24, 47/06*
U.S. Cl. 166—251 **36 Claims**

2. A method for determining the locus of a processing zone advancing through a fragmented permeable mass of particles in an in situ oil shale retort in a subterranean formation containing oil shale, the method comprising the step of monitoring pressure in the fragmented mass at at least two locations spaced



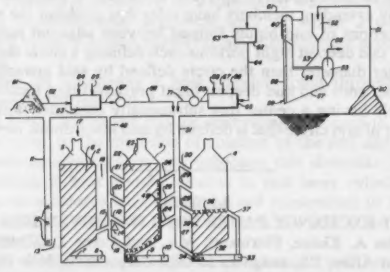
apart from each other in the direction of advancement of the processing zone.

4,120,355

METHOD FOR PROVIDING FLUID COMMUNICATION FOR IN SITU SHALE RETORT

Jay C. Knepper, Denver, and Eugene L. Grossman, Littleton, both of Colo., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 30, 1977, Ser. No. 829,070
Int. Cl.[2] E21C *41/10*; E21B *43/24, 33/13*
U.S. Cl. 166—259 **5 Claims**



1. A method for the recovery of shale oil and disposal of spent oil shale comprises:

forming a subterranean oil shale retort containing a rubblized retortable mass of oil shale, said retort being substantially surrounded by a mass of unmined formation;

retorting the oil shale contained in said subterranean retort so as to recover at least a portion of the shale oil present;

drilling at least one hole through the unmined formation adjacent to the retort;

providing communication between at least one of said holes and an adjacent retort; and

passing an aqueous slurry of spent oil shale through said drill hole into said retort;

so that spent oil shale can be effectively disposed of in a manner not detrimental to the environment.

4,120,356

WELL-CLEANING PROCESS USING VISCOSIFIED SURFACTANT SOLUTIONS

John J. Meister, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 728,377, Sep. 30, 1976, Pat. No. 4,071,457, which is a division of Ser. No. 654,435, Feb. 2, 1976, Pat. No. 4,007,792. This application Oct. 31, 1977, Ser. No. 847,203
Int. Cl.[2] E21B *43/00, 21/00*
U.S. Cl. 166—267 2 Claims

1. A method for cleaning a borehole comprising:

(a) introducing into said borehole a composition comprising in admixture:

(1) a fluid consisting essentially of

(A) 10–90 weight percent of water and

(B) 90–10 weight percent of chloroform,

(2) 1–5,000 ppm of a cationic surfactant,

(3) 1–5,000 ppm of an anionic surfactant,

(4) 50–20,000 ppm acid in a quantity sufficient to reach a pH of ≦4.5 in the aqueous phase, and

(5) 50–20,000 ppm buffer salt in mol ratio of buffer salt to acid component (4) in the range of 0.1:1 to 5:1;

the ppm values being based on the combined weight of water and chloroform;

(b) removing said composition comprising borehole cuttings from the borehole,

(c) letting the composition comprising the borehole cuttings settle, and

(d) recovering at least a portion of the liquids of said composition.

4,120,357

METHOD AND APPARATUS FOR RECOVERING VISCOUS PETROLEUM FROM THICK TAR SAND

Donald J. Anderson, Newport Beach, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 11, 1977, Ser. No. 840,689
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—272 8 Claims

1. A method of assisting the recovery of viscous petroleum from a petroleum-containing formation comprising the steps of forming a production well through a petroleum-containing formation, said formation having an initial low potential for fluid injection, inserting a casing string having a production opening near its lower portion into said production well, providing a production flow line in said production well from a position adjacent said production opening to the earth's surface, extending a tubular member into said production well to form a closed-loop flow path from the earth's surface to the lower portion of said formation and back to the earth's surface, circulating a hot fluid through said closed-loop flow path to heat the viscous petroleum in said formation adjacent at least a portion of said production well to form a first potential passageway for fluid flow through said formation, providing a plurality of injection wells linearly spaced apart from said production well and communicating with the upper portion of said formation, the first of said injection wells positioned for injection of hot drive fluid into said first potential passageway for fluid flow in said formation and the remaining injection wells linearly spaced apart from said first injection well and each other at least a distance equal to the distance between said production well and said first injection well, injecting a hot drive fluid through said first injection well into the upper portion of said formation into said first potential passageway to promote flow of petroleum to the production opening near the bottom of said casing string of said production well and to form a second potential passageway for fluid flow in said formation communicating with the next adjacent linearly spaced apart injection well, stopping injection of hot drive fluid through said first injection well when significant breakthrough of hot drive fluid occurs in said production well, starting injection of hot drive fluid through said next adjacent injection well into said second potential passageway for fluid flow in said formation to promote flow of petroleum to said production well and progressively stopping hot drive fluid injection at a given injection well as significant hot drive fluid breakthrough to the said production well occurs and starting hot drive fluid injection at the next further linearly spaced apart injection well.

5. A system for use in assisting the recovery of viscous petroleum from a petroleum-containing formation comprising a production well extending through a viscous petroleum-containing formation, a casing string having a production opening near its lower portion positioned in said production well, a production flow line in the said casing string extending from a position adjacent said production opening to the earth's surface, a tubular member into said casing string forming a closed-loop flow path from the earth's surface to the lower portion of said formation and back to the earth's surface, a source of hot fluid, conduit means connecting said source of hot fluid to said closed-loop flow path for circulation therethrough to heat the viscous petroleum in said formation adjacent at least a portion of said production well to form a first potential passageway for fluid flow through said formation, a plurality of injection wells linearly spaced apart from said production well and communicating with the upper portion of said formation, the first of said injection wells positioned for injection of hot drive fluid into said first potential passageway for fluid flow in said formation and the remaining injection wells linearly spaced apart from said first injection well and each other at least a distance equal to the distance between said production well and said first injection well, a source of hot drive fluid, conduit means connecting said source of hot drive fluid to said injection wells and valve means on said conduit means for selectively controlling flow of hot drive fluid to said injection wells.

4,120,358

SURFACTANT OIL RECOVERY METHOD FOR USE IN HIGH TEMPERATURE FORMATIONS CONTAINING WATER HAVING HIGH SALINITY AND HARDNESS

George Kalfoglou, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 643,965, Dec. 24, 1975, Pat. No. 4,016,932. This application Apr. 11, 1977, Ser. No. 786,165
The portion of the term of this patent subsequent to Apr. 12, 1994, has been disclaimed.
Int. Cl.[2] E21B *43/22*
U.S. Cl. 166—275 7 Claims

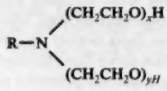
1. A method for recovering petroleum from a subterranean, permeable, petroleum-containing formation, which formation also contains water having a salinity from about 40,000 to about 140,000 parts per million total dissolved solids including from 3,000 to 12,000 parts per million polyvalent ions including calcium and magnesium, the temperature of said formation being from about 80° F. to about 180° F., said formation being penetrated by at least one injection well and by at least one production well, both wells being in fluid communication therewith, comprising

(a) injecting into the formation via the injection well, an aqueous saline surfactant-containing fluid to displace pe-

troleum through the formation toward the production well, said surfactant-containing fluid comprising:

(1) at least one primary anionic surfactant selected from the group consisting of petroleum sulfonate, alkyl sulfonates having from 8 to 25 carbon atoms, alkylaryl sulfonates having from 5 to 20 carbon atoms in the alkyl chain, and mixtures thereof;

(2) a dipolyethoxylated alkyl or alkylaryl amine nonionic surfactant having the following structure



wherein R is an alkyl radical having from 6 to 25 carbon atoms, or an alkylaryl group having from 6 to 25 carbon atoms in the alkyl chain; and

x and y are 1 to 12 and the sum of x and y is from 2 to 24, the total number of ethoxy groups per molecule of the nonionic surfactant being chosen so that the cloud point of the nonionic surfactant at the salinity of the formation water is from 20° F. to 80° F. greater than the temperature of the formation, the concentration of each of said anionic surfactant and said nonionic surfactant in the aqueous fluid being in the range from about 0.05 percent to about 5 percent by weight

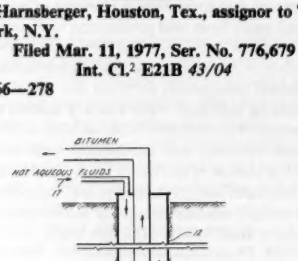
(b) recovering petroleum displaced by the surfactant containing fluid from the formation via the producing well.

4,120,359

METHOD FOR FORMING A NON-DISSOLUBLE SAND CONTROL PACK AND A SAND CONTROL PACK MADE THEREBY

Bobby G. Harnsberger, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Mar. 11, 1977, Ser. No. 776,679
Int. Cl.[2] E21B *43/04*
U.S. Cl. 166—278 **10 Claims**



1. A method for forming a pack of solid particulate material for resisting the deteriorating and dissolving effect of continuous hot steam flooding in a well bore for penetrating a petroliferous formation comprises,

(a) selecting a granular material that is resistant to solubility at the temperatures of hot steam of silicon carbide,

(b) mixing a slurry of the granular silicon carbide material, and

(c) injecting the slurry of insoluble unconsolidated granular silicon carbide material into the well bore opposite the permeable formation to create a permeable pack of particulate material against the formation face thereby minimizing migration of sand and other formation particles into the well bore from the formation and particularly for resisting continuous high heat exposure, as from the steam flooding.

4,120,360

TREATING WELLS TO MITIGATE FLOW-AFTER-CEMENTING

Joseph U. Messenger, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 16, 1977, Ser. No. 796,912
Int. Cl.[2] E21B *33/14*
U.S. Cl. 166—293 **6 Claims**

1. A method of cementing a well that penetrates the earth, comprising the steps of:

blending a low-density calcined shale cement with attapulgite in an amount no greater than about 2 weight percent based on cement and water in an amount to form a thixotropic cement slurry having a density within the range of 11.5 lb/gal to 13.5 lb/gal and having essentially zero water separation;

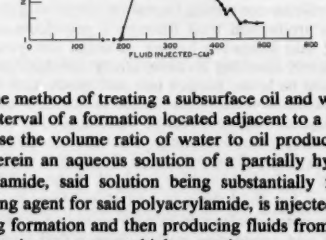
injecting said slurry down said well; and maintaining said slurry in said well to allow said slurry to set.

4,120,361

METHOD FOR REDUCING THE PERMEABILITY OF SUBTERRANEAN FORMATIONS TO BRINES

Curtis B. Threlkeld; James E. Hessert, and Richard L. Clampitt, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 462,325, Apr. 19, 1974, Pat. No. 3,949,811, which is a continuation-in-part of Ser. No. 353,452, Apr. 23, 1973, abandoned, and Ser. No. 359,722, May 14, 1973, abandoned, said Ser. No. 353,452, Continuation-in-part of Ser. No. 193,338, said Ser. No. 359,722, Continuation-in-part of Ser. No. 184,784. This application Sep. 11, 1975, Ser. No. 612,514
Int. Cl.[2] E21B *33/138, 43/22, 43/25*
U.S. Cl. 166—294 **7 Claims**


BRINE: HARD (170,000 PPM TOTAL DISSOLVED SOLIDS)
POLYMER: 3000 PPM 11% HYDROLYZED POLYACRYLAMIDE IN HARD BRINE
BRINE: HARD (170,000 PPM TOTAL DISSOLVED SOLIDS)
CORE: (4350 FT.) SAND ARCHER CO. TEXAS
HARD BRINE
POLYMER
HARD BRINE
RESISTANCE FACTOR
FLUID INJECTED-CM³

1. In the method of treating a subsurface oil and water-producing interval of a formation located adjacent to a well bore to decrease the volume ratio of water to oil produced therefrom wherein an aqueous solution of a partially hydrolyzed polyacrylamide, said solution being substantially free of a crosslinking agent for said polyacrylamide, is injected into the producing formation and then producing fluids from said formation, the improvement which comprises:

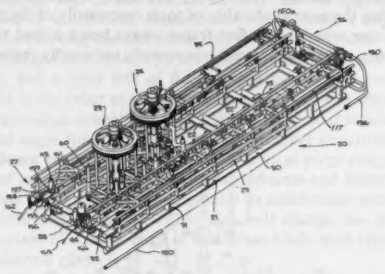
crosslinking the polymer after it is introduced into the formation and prior to producing fluids from the treated formation by contacting said polymer with an aqueous solution containing a water soluble salt of a di or trivalent metal cation or an organic crosslinking agent.

4,120,362

SUBSEA STATION

Georges M. Chateau, Pau, France, and Chester B. Falkner, Jr., Huntington Beach, Calif., assignors to Societe Nationale Elf Aquitaine (Production), France

Filed Nov. 22, 1976, Ser. No. 743,586
Int. Cl.[2] E21B 33/035
U.S. Cl. 166—339 16 Claims



1. A subsea installation for assembly and use in virtually any depth of water by vertical installation of subsea components comprising, in combination:

an elongated rectangular rigid base frame means adapted to be permanently placed on a sea floor and having top and bottom parallel side members,

said base frame means including transverse members providing a plurality of framed receptor openings with said side members,

a conductor pipe centrally located in each opening,

support members for said conductor pipe connected to said side and transverse members;

a base guide unit receivable in one of said receptor openings, coaxially aligned with said conductor pipe, and removably secured to said support members;

a removable, unitary module assembly vertically cooperable with said base guide unit for aligning and registering said module assembly with said one receptor opening in said base frame means;

said module assembly having well operable means adapted for connection to well components by relative vertical movement;

said side members and said transverse members at ends of said base frame means having vertically disposed guide means for connection by relative vertical movement to well operating components;

and control means supported from said base frame means for said module assembly and releasably interconnected with said module assembly.

4,120,363

ROOT CROP HARVESTER

Arnold E. Ernst, Wolverton, Minn. 56594, assignor to Arnold E. Ernst, Wolverton, Minn.

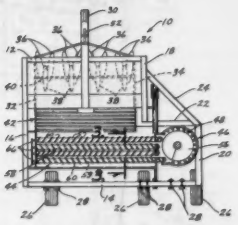
Filed Nov. 26, 1976, Ser. No. 744,967
Int. Cl.[2] A01D 19/02
U.S. Cl. 171—58 3 Claims

1. A root crop harvester including a main frame having transversely extending front and rear frame members; wheel means secured to and supporting the rear of the main frame; hitch means secured to a forward portion of the main frame and adapted to be connected to a propelling tractor for at least partially supporting the front of the main frame; root digging means secured to and depending from the front frame member; first conveyor means supported from the main frame behind the root digging means for receiving roots therefrom and moving the same upwardly and rearwardly; second conveyor means including a plurality of transversely extending elongated rollers rotatably mounted on the frame in parallel relation for receiving roots from the first conveyor means and moving the same laterally; a vertical auger conveyor mounted on the frame and including a rotatable auger disposed at one end of the second conveyor means for receiving roots therefrom and elevating the roots for discharge purposes, and drive means for the first conveyor means, second conveyor means, and vertical auger conveyor said drive means being supported on the main frame and including a main drive shaft extending generally forwardly along the hitch means for connection with the tractor; wherein the improvement comprises:

first resiliently yieldable mounting means attached to the main frame and supporting the forwardmost roller at the vertical auger conveyor end, said first mounting means disposed forward of said forwardmost roller toward the hitch means, wherein said first resiliently yieldable mounting means includes:

a hollow cylinder attached intermediate the ends thereof to said frame and disposed forward to said forwardmost roller;

an end member attached at one end to the forwardmost end of said cylinder and having an opening in the opposite end thereof;



a yoke rotatably attached to said forwardmost roller;

a rod attached at one end to said yoke and adapted to slideably engage the interior of said hollow cylinder;

a threaded shaft attached at one end to the opposite end of said rod and having the opposite end thereof extending through the opening in said end member;

a coil tension spring surrounding said threaded shaft and disposed such that one end is in contact with said opposite end of said rod;

a sleeve member surrounding said threaded shaft and disposed such that one end contacts said end member and the opposite end thereof contacts the opposite end of said spring; and

a nut threadably engaging said opposite end of said threaded shaft extending exterior of said end member; and

second resiliently yieldable mounting means attached to the main frame and supporting the rearwardmost rollers at the vertical auger conveyor end, said second mounting means disposed rearward of said rearwardmost roller away from the hitch means.

4,120,364

AUTOMATIC CONTROL DEVICE FOR TRACTOR MOUNTED TOOLS

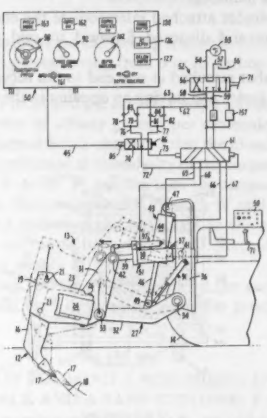
Darrel M. Wooldridge, Oakland, Calif., assignor to American Tractor Equipment Corporation, Oakland, Calif.

Continuation-in-part of Ser. No. 570,034. This application Mar. 3, 1977, Ser. No. 773,954
Int. Cl.[2] A01B 63/111
U.S. Cl. 172—2 8 Claims

1. An improvement in a tractor mounted tool having a power operated tool positioning mount and a control circuit therefor which includes a depth control circuit having depth sensor means for detecting vertical displacement of the tool and generating an output signal in proportional relationship with the instantaneous position of the tool, a depth selector means connected in the depth control circuit with the depth sensor means and having means for displaying a preselected

position setting of the tool and generating an output signal in proportional relationship with the preselected position, a pitch control circuit connected in the control circuit with the depth selector means, the pitch control circuit including a pitch sensor means for detecting angular displacement of the tool and generating an output signal in proportional relationship with the angular position of the tool, and a pitch selector means connected with the pitch sensor means, and control means connected in the circuit, the improvement comprising:

the depth and pitch control circuits each being connected together and each including a bridge connected voltage divider with the sensor and selector means of each circuit being a part of the bridge connected voltage divider associated with said each circuit; and



the control means including null means connecting said sensor and selector means in each of said depth and pitch control circuits forming a null detector between each of said voltage dividers, a depth relay connected to a depth null means and a pitch relay connected to a pitch null means, said depth relay being de-energized when the potential difference between the depth sensor and the depth selector is below a triggering voltage of said depth null means, said control means of said depth and pitch control circuits each generating a control output signal when the sensor means output signal correspondingly compares with the selector means output signal thereby denoting that the power operated tool is at a preselected position, said pitch circuit control means being connected with said depth circuit and initiating a change in pitch of the tool when the tool is detected at a preselected depth.

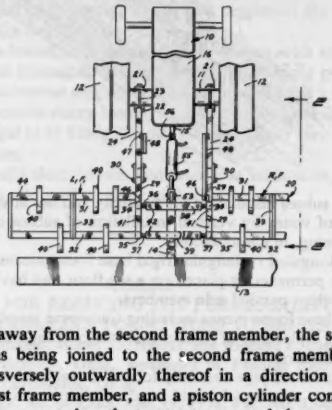
4,120,365

TRACK ELIMINATOR APPARATUS

Leo A. Kuhn, 225 Clark Ave., Harvey, N. Dak. 58341

Filed Apr. 28, 1977, Ser. No. 791,796
Int. Cl.[2] A01B *63/102*
U.S. Cl. 172—488 **6 Claims**

4. In combination with a tractor having a rear axle, transversely opposite rear wheels and hitch mechanism between the rear wheels, track eliminator apparatus comprising a first and second longitudinally extending bottom frame member that is parallel to the other, each longitudinal bottom frame member having a first end and a second end, for each bottom longitudinal frame member at least one upright, each upright having a lower end joined to the respective longitudinal bottom frame member and an upper end at a substantially higher elevation than the bottom frame members, means extending transversely between the longitudinal bottom frame members only at about the elevation of the upper ends of the uprights for connecting each upright on one bottom longitudinal frame member to the other to through the uprights retain the longtiudinal bottom frame members substantially transversely spaced from one another, first draw bar means pivotally mounted on the tractor for connecting the first frame member to the tractor, second draw bar means pivotally mounted on the tractor in substantial transverse spaced relationship to the first draw means for connecting the second frame member to the tractor, a first plurality of earth breaking tools, a second plurality of earth breaking tools, first transversely extending frame means for mounting the first plurality of tools rearwardly of one of the rear wheels, second transversely extending frame means for mounting the second plurality of tools rearwardly of the other of the rear wheels, said first frame means being joined to the first frame member to extend transversely outwardly thereof in



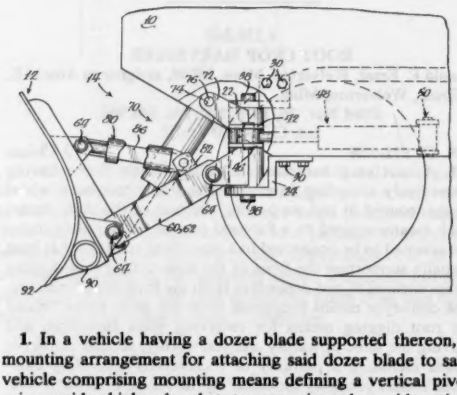
a direction away from the second frame member, the second frame means being joined to the second frame member to extend transversely outwardly thereof in a direction away from the first frame member, and a piston cylinder combination pivotally mounted on the tractor transversely between the first and second draw bar means and pivotally connected to the means connecting the uprights for moving the last mentioned means between a tool ground breaking position and a tool elevated ground travel position, and a grain drill having a grain box longitudinally on the opposite side of the ground engaging tools from the tractor and a tow bar extending beneath the means connecting the uprights and connected to the tractor.

4,120,366

MOUNTING ARRANGEMENT FOR DOZER BLADE

Roland N. Nissen, Wichita, and James S. Flippin, Clearwater, both of Kans., assignors to J. I. Case Company, Racine, Wis.

Filed Aug. 31, 1977, Ser. No. 829,221
Int. Cl.[2] E02F *3/76*
U.S. Cl. 172—805 **6 Claims**



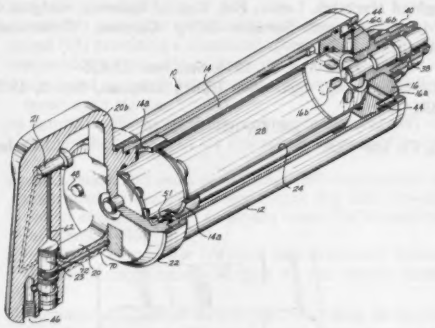
1. In a vehicle having a dozer blade supported thereon, a mounting arrangement for attaching said dozer blade to said vehicle comprising mounting means defining a vertical pivot axis on said vehicle, a bracket structure pivoted on said vertical pivot axis, a single angle fluid ram connected to said vehicle

and said bracket structure for pivoting said bracket structure about said vertical pivot axis, a pair of arms each having one end connected by a universal connection to said bracket structure at horizontally spaced locations, said arms having opposite ends connected by universal connections at horizontally spaced locations on said dozer blade, rigidifying means between said bracket structure and said blade preventing transverse movement therebetween, a single lift fluid ram having one end pivoted on said bracket structure and an opposite end pivoted by a universal connection on said blade, a single tilt fluid ram having one end connected to one of said arms and an opposite end connected by a universal connection to said dozer blade, and a rigid link of fixed length having one end connected to the other of said arms and an opposite end connected by a universal connection to said dozer blade so that actuation of said angle fluid ram will pivot said bracket structure, arms and dozer blade as a unit about said vertical pivot axis, actuation of said lift fluid ram will pivot said arms and dozer blade as a unit about a horizontal pivot axis on said bracket structure, and actuation of said tilt fluid ram will change the angular orientation of a lower edge of said dozer blade with respect to a horizontal plane.

4,120,367
PNEUMATIC IMPACT GUN

David Lee Wagner, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 699,772, is a continuation-in-part of Ser. No. 591,972, Jun. 30, 1975, abandoned. This application Jul. 8, 1977, Ser. No. 782,806
The portion of the term of this patent subsequent to Aug. 2, 1994, has been disclaimed.
Int. Cl.² B21J *15/18*
U.S. Cl. 173—137 **3 Claims**



1. A pneumatic impact gun for upsetting one end of a rivet in a single impact comprising:

piston means slidably arranged in a cylinder for impacting an anvil disposed at the downstream end of said cylinder;

means for admitting a manually adjustable flow of air into said cylinder to displace said piston means a predetermined distance downstream within said cylinder over a variable time;

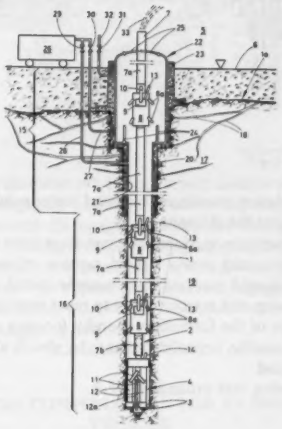
means for storing an accumulated charge of compressed air arranged to communicate with said piston means; and,

means for passing compressed air from said storage means so that when said piston means has been displaced a predetermined distance by the flow of compressed air from said admitting means, said storing means dumps an accumulated charge of compressed air into contact with the upstream side of said piston means to displace said piston means rapidly downstream in said cylinder to thereupon impact said anvil, wherein said piston means comprises a thin-walled circular cylinder with a hemispherical dome at the downstream end, said dome carrying shoulders therein and a boss thereon, said boss impacting said anvil when said piston moves downstream.

4,120,368
SUPPLYING MOTIVE FLUID TO BELOW GROUND TOOL DRIVE FROM A PRESSURIZED BORE HOLE

Sven Halvor Johansson, Saab Scania Aktiebolag, Linkoping, Sweden (S 581 88)

Filed Nov. 3, 1977, Ser. No. 848,219
Claims priority, application Sweden, Nov. 5, 1976, 7612371
Int. Cl.² E21B *1/08, 3/12*
U.S. Cl. 175—71 **9 Claims**



7. A method of deepening a substantially deep bore hole in the earth with the use of a drill driven by a pneumatic motor that has a pressure air inlet and an exhaust air outlet and a duct which extends upwardly through the bore hole from said motor, which method is characterized by:

A. communicating the interior of said duct with the atmosphere at the upper end of the duct;

B. sealing the upper end portion of the bore hole air tight all around said duct;

C. forcing air under pressure into the bore hole beneath the sealed upper end portion thereof, externally of said duct;

D. communicating the pressure air inlet of said motor with the bore hole externally of said duct;

E. directing exhaust air from the exhaust air outlet of said motor into the interior of said duct; and

F. communicating the interior of said duct with a localized zone in the bottom of the bore hole that is external to the duct to thereby enable drilling debris to be forced into the duct and up through it to the surface by pressurized air from the bore hole.

4,120,369
METHOD FOR DRILLING A WELL THROUGH UNCONSOLIDATED DOLOMITE FORMATIONS

Paul W. Fischer, Whittier; David S. Pye, Brea, and Julius P. Gallus, Anaheim, all of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Oct. 3, 1977, Ser. No. 838,895
Int. Cl.² E21B *33/138*
U.S. Cl. 175—72 **18 Claims**

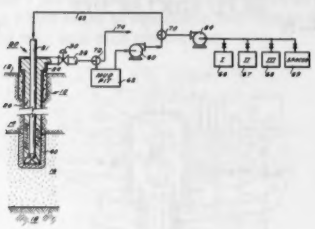
1. In a method for drilling a bore hole through a subterranean formation containing one or more zones of unconsolidated dolomite, the improvement which comprises the steps of:

(a) drilling a distance through said subterranean formation,

thereby exposing a newly drilled portion of said formation;

(b) interrupting said drilling;

(c) introducing into said bore hole a sequence of discrete reactant slugs of substantially oil-free solutions comprised of (I) an aqueous solution containing a water-soluble acid, a water-soluble surface active agent and a first water-soluble precipitating agent for silicates; (II) an aqueous solution containing a water-soluble silicate; and (III) an aqueous solution containing a second water-soluble precipitating agent for silicates;



(d) displacing each of said reactant slugs from said bore hole and into said newly drilled portion of said formation, wherein said reactant slugs become mixed;

(e) allowing said reactant slugs to react in said newly drilled portion of the formation, thereby forming a substantially impermeable, consolidated annular sheath about said bore hole; and

(f) resuming said drilling.

4,120,370

WEIGHING EQUIPMENT

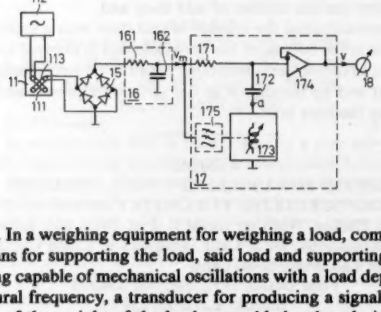
Jorgen Bosson, and Gunnar Cragfors, both of Vesteras, Sweden, assignors to Asea Aktiebolag, Vasteras, Sweden

Filed Jun. 14, 1976, Ser. No. 695,386

Claims priority, application Sweden, Aug. 28, 1975, 7509541

Int. Cl.[2] G01G *23/10, 19/18*

U.S. Cl. 177—185 **10 Claims**



1. In a weighing equipment for weighing a load, comprising: means for supporting the load, said load and supporting means being capable of mechanical oscillations with a load dependent natural frequency, a transducer for producing a signal indicative of the weight of the load, a tunable band exclusion filter for filtering said signal and including an input connected to the transducer for receiving said signal and tuning means responsive to said signal for varying the tuning of the filter in accordance with the natural frequency of said mechanical oscillations.

4,120,371

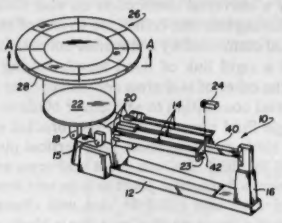
LOAD HOLDER EXTENSION FOR BEAM BALANCE SCALES

Robert Allen Zohn, and Carole Zohn, both of Great Neck, N.Y., assignors to Correct Count Company Inc., Mineola, N.Y.

Filed Nov. 29, 1977, Ser. No. 855,717

Int. Cl.[2] G01G *21/22*

U.S. Cl. 177—262 **16 Claims**



1. An extension platform for a beam balance weighing scale comprising:

a generally planar upper surface;

a lower surface provided with a grid of reinforcing ribs thereon subdividing said lower surface into a plurality of compartments;

and a seating projection depending from said lower surface configured and dimensioned for seating about the peripheral edge of the weighing platform of a beam balance scale of predetermined size.

4,120,372

JOINTS

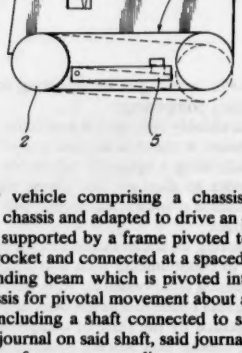
Siegfried Hartwich, Letter, Fed. Rep. of Germany, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Aug. 30, 1976, Ser. No. 719,035

Claims priority, application United Kingdom, Sep. 2, 1975, 36359/75

Int. Cl.[2] B62D *55/10*

U.S. Cl. 180—9.5 **3 Claims**



1. A crawler vehicle comprising a chassis, a sprocket mounted on said chassis and adapted to drive an endless track, said track being supported by a frame pivoted to said chassis adjacent said sprocket and connected at a spaced location to a transversly extending beam which is pivoted intermediate its ends to said chassis for pivotal movement about a longitudinal axis, said joint including a shaft connected to said frame, an axially movable journal on said shaft, said journal presenting a spherical outer surface to a complimentary race, a housing connected to said race extending in an axial direction beyond said journal, two pieces to said housing, fastening means by which said pieces are connected to each other and connected to said beam to form a cavity between said shaft and said housing, said pieces each having apertures therein for passage

of said shaft therethrough which are larger than the periphery of said shaft, and sealing means located in said housing and abutting said shaft and said housing to close the apertures in said pieces to form a joint which permits relative movement in a longitudinal direction while inhibiting movement in a transverse direction.

4,120,373

VEHICLE SPEED CONTROL SYSTEM WITH DUAL INTERRUPT SAFETY CIRCUIT

Helmut Fleischer, Schwieberdingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 22, 1977, Ser. No. 770,585

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1976, 2609843

Int. Cl.[2] **B60K** *31/00*

U.S. Cl. 180—105 E **12 Claims**

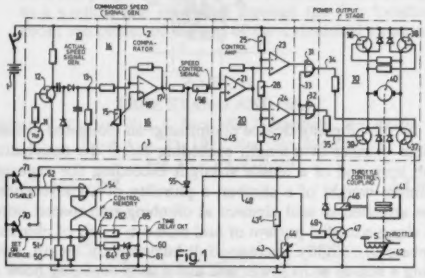


Fig.1

1. Vehicle speed control system to control a fuel supply element (42) of an internal combustion (IC) engine driving the motor vehicle comprising

means (10) providing an actual speed signal;

means (14) providing a command speed signal;

comparator means (16) connected to said actual and said command speed signal providing means and providing a speed error signal;

an automatically controllable positioning element (40) controlling the position of the fuel supply element (42) of the engine;

a control stage (20) and a power stage (30) connected to and controlled by the comparator means (16) and providing output energization for automatic control of the positioning element (40);

a selectively engageable coupling (41) interposed between the positioning element (40) and the fuel supply element (42);

electromagnetic control means (46) controlling, in response to an "engage" and a "disable" signal, respectively, selective engagement and disengagement of the coupling (41) to thereby engage or disable control of the fuel supply element position as a function of speed error signals, and

means (50, 55, 56) applying the "disable" signal as an overriding speed control signal to the automatically controllable positioning element to command operation of the positioning element (40) in a direction to move the fuel supply element to idle speed fuel supply position.

4,120,374

SAFETY START SWITCH AND POWER TAKEOFF CONTROL VALVE ARRANGEMENT

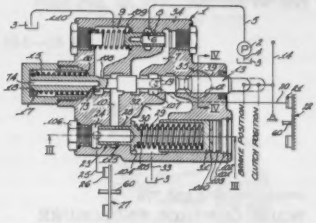
Charles P. Heisig, Cudahy, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed May 4, 1977, Ser. No. 793,606

Int. Cl.[2] **B60J** *23/00*; **B60K** *28/00*

U.S. Cl. 180—53 R **10 Claims**

1. A safety device for use on a motor vehicle comprising, a starting circuit including, a safety start switch in said starting circuit for disabling said starting circuit when said safety start switch is open, a plunger for operating said safety start switch, resilient means normally biasing said safety switch to an open position, a drive shaft, a power takeoff drive line including a power takeoff shaft, a hydraulic clutch coupling said drive shaft with said power takeoff shaft through said drive line, a hydraulic circuit including a control valve for controlling operation of said hydraulic clutch, insulating mounting means supporting said safety start switch on said control valve, a



longitudinally movable valve spool in said control valve defining a clutch engaging position for selectively engaging said clutch and a clutch disengaging position for disengaging said clutch, means on said valve spool engaging said plunger of said safety start switch for permitting opening said safety start switch when said valve spool is in the clutch engaging position and closing said safety start switch when said valve spool is in the clutch disengaging position.

4,120,375

TILTABLE CAB CONSTRUCTION FOR AN INDUSTRIAL VEHICLE

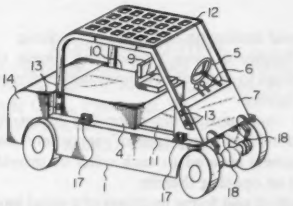
Akibumi Shinoda, Handa, and Noriyoshi Kido, Toyota, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Japan

Filed Apr. 6, 1977, Ser. No. 785,124

Claims priority, application Japan, Apr. 15, 1976, 51/47855[U]; Jul. 30, 1976, 51/102413[U]

Int. Cl.[2] **B62D** *33/06*

U.S. Cl. 180—89.14 **4 Claims**



1. An industrial vehicle comprising:

first and second parallel side frame members;

at least one cross-member interconnecting said frame members;

vehicle operating and drive apparatus disposed between said frame members;

a cab including an engine hood, a toe board, a front protector, vehicle driving and operating means and a driver's seat, said cab being supported by and disposed atop said frame members and extending therebetween, one side of said cab being pivotally mounted by hinge means to one of said frame members, the other side of said cab being detachably secured to the other frame member;

said cab having two longitudinal reinforcing members affixed thereto beneath said hood and toe board and disposed between and parallel to said side frame members,

each of said reinforcing members being near a corresponding said frame members, with a small space therebetween;

said cab being spaced from said one frame member by said hinge means;

a resilient mat disposed on the other frame member for supporting said cab;

whereby the spaces between (i) said reinforcing members and said frame members and (ii) said cab and said frame members comprise labyrinths for attenuating noise generated by said apparatus.

4,120,376

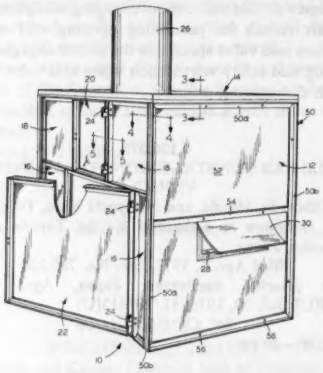
NOISE CONTROL ENCLOSURE

Charles E. Palmer, Turnpike Rd., Somers, Conn. 06071

Filed Nov. 8, 1976, Ser. No. 739,485

Int. Cl.[2] E04B *1/82*

U.S. Cl. 181—204 **19 Claims**



1. A sound deadening enclosure comprising:

(a) a plurality of sound deadening panels disengageably assembled to each other to form said enclosure, said panels each having:

(1) a structural frame extending about the periphery thereof and comprised of oppositely disposed frame members secured to each other to provide said frame and an opening therein;

(2) each of said frame members of a panel having a mounting surface extending inwardly of the periphery of said frame;

(3) a sheet of sound deadening material extending across and closing said opening and overlying said mounting surfaces of said frame members of each structural frame;

(4) means securing the overlying portions of each of said sheets to the mounting surfaces it overlies, each of said sheets of sound deadening material being disposed so as to cover its associated structural frame whereby said structural frame is completely shielded by said sound deadening material from the interior of said enclosure; and

(b) fastening means disengageably connecting abutting frame members of adjacent panels to each other with a portion of said sound deadening sheet of said panels interposed between at least some abutting frame members to provide an acoustical seal therebetween.

4,120,377

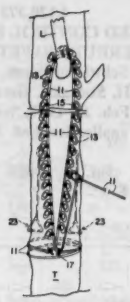
TREE-CLIMBING KIT

Edward David Charles, and Edward H. Charles, both of Rte. 2, Box 251, Creal Springs, Ill. 62922

Filed Jun. 22, 1977, Ser. No. 809,063

Int. Cl.[2] A63B *27/00*; E06C *5/36*

U.S. Cl. 182—3 **11 Claims**



1. A tree-climbing device comprising: an elongated slender flexible element of a length exceeding twice the anticipated climb limit and of a tensile strength exceeding the expected maximum weight of a climber; a plurality of hook-receiving loops attached to said element at climbing-step-spaced intervals along a medial portion of said element; a pair of climbing members of roughly average-adult-human-body length, each having a stirrup at its lower end and a loop-engaging hook at its upper end; and means for firmly fastening the end portions of said element low on the trunk of said tree after said element has been draped over the base of a limb, said last-mentioned means comprising a first hook-ended rigid element fixed to one end of said flexible element and a second hook-ended rigid element attachable to one of said loops, both of said elements being adapted to receive loop-free end portions of said flexible element in fastening it to said tree trunk.

4,120,378

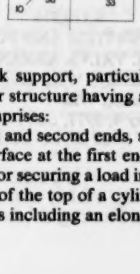
MOVABLE WORK SUPPORT FOR CYLINDRICAL STRUCTURES

Ernest E. Mills; E. Bennett Mills, and Stanley L. Mills, all of R.R. 1, Straughn, Ind. 47387

Filed Mar. 7, 1977, Ser. No. 774,772

Int. Cl.[2] E04G *3/10*

U.S. Cl. 182—14 **18 Claims**



1. A movable work support, particularly adapted for use within a silo or similar structure having a cylindrical side wall and a top, which comprises:

a frame having first and second ends, said frame including a work support surface at the first end;

attachment means for securing a load including said frame to about the center of the top of a cylindrical structure, said attachment means including an elongated member having

a first end portion connectable at a first location at about the center of the top of the structure and a second end portion connected to said frame, the load secured by the elongated member having a center of gravity;

vertical movement means for moving said frame vertically with respect to the cylindrical structure;

horizontal movement means for moving said frame in a horizontal plane relative the cylindrical structure;

bearing means connected with said frame at the second end of said frame for bearing against the side wall of the cylindrical structure at a second location, the distance between the work support surface of said frame and the second location being greater than half the interior diameter of the cylindrical structure to position the work support surface adjacent a part of the side wall opposite the second location; and

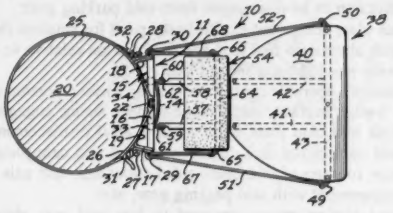
locating means for causing the distance between the center of gravity of the load and the second location to be greater than the perpendicular distance from the second location to a vertical line extending through the first location at about the center of the top of the cylindrical structure.

4,120,379

TREE STAND AND SEAT

Samuel E. Carter, Rte. 4, Box 263, Leitchfield, Ky. 42754

Filed Aug. 22, 1977, Ser. No. 826,518
Int. Cl.[2] A47C 9/10
U.S. Cl. 182—187 **4 Claims**



1. A combination tree stand and seat structure comprising:

(a) a normally upright frame member having opposite sides, top and bottom end portions, and a normally vertical axis,

(b) first and second flexible linear suspension members having respectively first and second ends,

(c) means fixing said first ends to the top end portion of said frame member,

(d) a first pair of connectors fixed to the top end portion of said frame member,

(e) a pair of second connectors, each second connector being fixed to an opposite side of the bottom end portion of said frame member,

(f) the second ends of said linear suspension members being adapted to be detachably connected to said first connectors or to said second connectors,

(g) a platform member having front and rear portions,

(h) lower hinge means on the bottom end portion of said frame member connected to the rear end portion of said platform member to support said platform member for swinging movement about an axis transverse to said vertical axis,

(i) first support means on said frame member connected to said platform member to limit the downward swinging movement of said platform member to an operative planar position substantially normal to said vertical axis,

(j) a seat member having front and rear portions,

(k) upper hinge means on said frame member above said lower hinge means connected to the rear end portion of said seat member to support said seat member for swinging movement about an axis transverse to said vertical axis, and

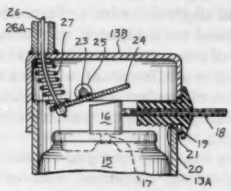
(l) second support means on said frame member connected to said seat member to limit the downward swinging movement of said seat member to an operative planar sitting position substantially normal to said vertical axis and spaced above said platform member a distance to permit a person to sit upon said seat member with his feet upon said platform member.

4,120,380

OILER FOR MOTORCYCLE DRIVE CHAINS

David R. Mann, 12 Weymouth St., Apt. 8, Portland, Me. 04101

Filed Jun. 20, 1977, Ser. No. 807,811
Int. Cl.[2] F16N 7/10
U.S. Cl. 184—15 R **7 Claims**



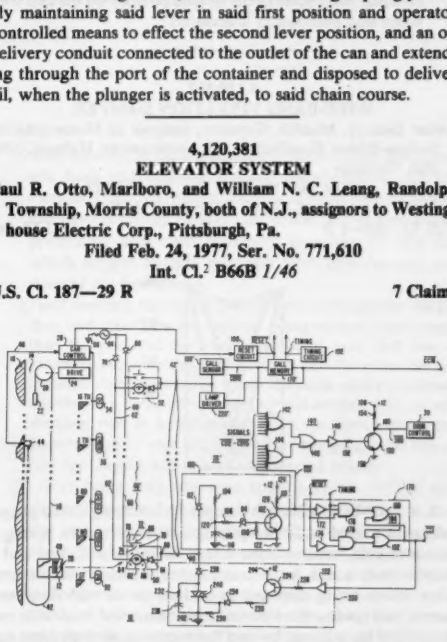
1. An oiler attachable to a frame member of a motorcycle and for use in lubricating the motorcycle chain with an oil can, the can of the type having an outlet the discharge through which is effected by the operation of a plunger exposed at one end of the can, said oiler including a container for said can and having a port and attachable to the frame member adjacent a course of said chain, said container comprising an open-ended chamber dimensioned to slidably receive said can with the plunger exposed and a cap removably attached to said chamber and dimensioned to receive the plunger within it, a lever pivotally supported in said cap, means connected to and operable to move said lever between a first inoperative position and a second position in which the lever moves the plunger to effect the discharge of oil, said means including a spring yieldably maintaining said lever in said first position and operator controlled means to effect the second lever position, and an oil delivery conduit connected to the outlet of the can and extending through the port of the container and disposed to deliver oil, when the plunger is activated, to said chain course.

4,120,381

ELEVATOR SYSTEM

Paul R. Otto, Marlboro, and William N. C. Leang, Randolph Township, Morris County, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 24, 1977, Ser. No. 771,610
Int. Cl.[2] B66B 1/46
U.S. Cl. 187—29 R **7 Claims**

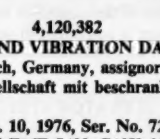


1. An elevator system, comprising:

a building having a plurality of floors,

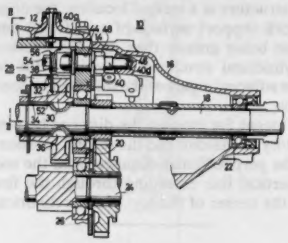
an elevator car mounted in said building,
motive means for said elevator car for moving said elevator car to serve the floors in said building,
call means for registering a call for elevator service including a plurality of pushbuttons and associated visual indicating means, and a single call wire for each pushbutton and its associated visual indicating means,
a source of alternating potential,
a first diode connected to said source of alternating potential providing half cycles of a first polarity,
a second diode connected to said source of alternating potential providing half cycles of a second polarity,
each of said pushbuttons and its associated visual indicating means having first ends connected in common to the associated single call wire, and second ends connected to said first and second diodes, respectively,
a plurality of sensor means, each of said sensor means being connected to a different call wire and being responsive to half cycles of the first polarity appearing on the call wire for providing a first signal while the associated pushbutton is actuated,
call memory means for each pushbutton switchable between first and second conditions, each of said call memory means switching from its first to its second condition in response to its associated sensor means providing a first signal, with said second condition indicating the registration of a call,
driver means for each visual indicating means responsive to an associated call memory means being in its second condition for energizing its associated visual indicating means from half cycles of the second polarity,
and reset means switching a selected call memory means back to its first condition when an associated registered call has been answered,
each of said sensor means providing a first signal each time its associated pushbutton is actuated to provide half cycles of the first polarity on the associated call wire notwithstanding half cycles of the second polarity on the call wire when said pushbutton is actuated.

4,120,382
WIDE-BAND VIBRATION DAMPER
Oskar Bschorr, Munich, Germany, assignor to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung, Munich, Germany
Filed Sep. 10, 1976, Ser. No. 722,128
Int. Cl.[2] F16F *7/00*; G10K *11/04*
U.S. Cl. 188—1 B **3 Claims**



1. A wide-band vibration damper for reducing sound propagation in a solid body comprising first horn means having a recess therein, reverse horn means having a wide end and a narrow end, and a force transmission element, said reverse horn means being disposed in said recess of said first horn means, said reverse horn means being connected at its wide end to the first horn means by said force transmission element and damping material means connecting said reverse horn means at its narrow end to said first horn means.

4,120,383
PARKING BRAKE MECHANISM FOR MOTOR VEHICLE EQUIPPED WITH AUTOMATIC TRANSMISSION
Tamio Kawamoto, Sagamihara, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan
Filed Apr. 4, 1977, Ser. No. 784,613
Claims priority, application Japan, Apr. 5, 1976, 51-37068
Int. Cl.[2] B60T *1/00*
U.S. Cl. 188—31 **6 Claims**

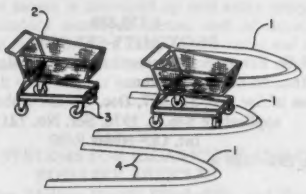


1. A parking brake mechanism for a motor vehicle transmission having a transmission output shaft on which a parking gear is securely mounted, comprising:
a brake pawl mounted for rotation about a first axis and carrying a tooth engageable with said parking gear;
first biasing means arranged to bias said brake pawl in a direction to be disengaged from said parking gear;
a cam plate connected to said brake pawl for rotation therewith about said first axis and for rotation relative to said brake pawl about a second axis;
a manually operable control rod having a raised portion with a wedge surface, said wedge surface being engageable with said cam plate upon relative axial displacement of said control rod in a direction toward said cam plate, to urge rotation of said brake pawl about said first axis into engagement with said parking gear; and
second biasing means arranged to bias said cam plate to rotate about said second axis in a first direction toward said wedge surface, to urge engagement of said cam plate with said wedge surface;
said wedge surface of said control rod including first and second inclined sections which are engageable with said cam plate to produce the rotation of said cam plate about said second axis in a direction opposite to said first direction against the bias of said second biasing means, and the rotation of said cam plate and said brake pawl about said first axis in a direction urging said brake pawl into engagement with said parking gear, respectively, the inclination angle of said first inclined section with respect to the axis of said rod being larger than that of said second inclined section;
said brake pawl having a surface to which said cam plate is attached in a manner that the cam plate is rotatable about said second axis along a plane containing said surface of said brake pawl, said surface being inclined with respect to said first axis so as to face toward said wedge surface of said control rod.

4,120,384
SHOPPING CART BRAKING APPARATUS
Kim L. Choy, 735 28th Ave., San Mateo, Calif. 94403
Filed Sep. 12, 1977, Ser. No. 832,347
Int. Cl.[2] B60T *3/00*
U.S. Cl. 188—32 **11 Claims**

8. A shopping cart braking system comprising:
a. a shopping cart having swivel wheels;

b. sloped surface members adapted for receiving said wheels; and



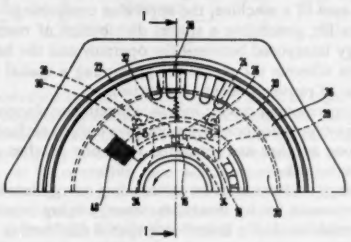
c. slanted sides of said wheels having an angular incident less than the slope of said surface members.

4,120,385

LOCKING DEVICE FOR A MECHANICAL ANTISKID REGULATOR

Willibald Roider, Munich, Fed. Rep. of Germany, assignor to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 17, 1977, Ser. No. 807,681
Int. Cl.[2] B60T 8/16
U.S. Cl. 188—181 R **6 Claims**



1. A locking device for a mechanical antiskid regulator for a brake system particularly on railway vehicles operated by a pressure medium comprising a flywheel mass coupled to an axle so as to be capable of independent movement with respect to the axle, a cam on said flywheel mass and having a central position, a cam disc coupled to rotate with a wheel of the axle and having a recess therein receiving said cam, a pair of spaced locking elements pivotally suspended on said cam disc on both sides of the central position of said cam, said locking elements each having a flange extending into said recess, a displaceable ring segment pivotally connected to said locking elements, and rotatably mounted stop means engageable with either side of said ring segment from either direction of rotation to displace said ring segment to pivot a said locking element such that a flange of the pivoted locking element is moved into the path of said cam to prevent said flywheel mass from deflecting in a direction as a function of the direction of rotation.

4,120,386

MULTIPLE PIECE BRAKING DISC ASSEMBLY

Franklin B. Airheart, Sylmar, Calif., assignor to Airheart Products, Inc., Chatsworth, Calif.

Filed May 6, 1977, Ser. No. 794,469
Int. Cl.[2] F16D 65/12
U.S. Cl. 188—218 XL **1 Claim**

1. A braking disc assembly connectable to rotating structure, comprising

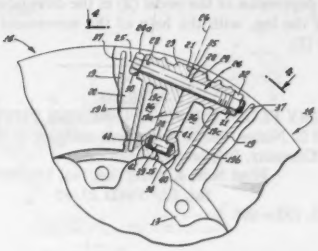
(a) multiple arc-shaped disc body sections having opposite faces for engagement with brake pads, said faces having radially spaced inner and outer edges,

(b) and retention means between said opposite faces for releasably retaining said sections in assembled relation to form an integrated disc with said faces maintained in two spaced parallel planes, said sections defining a first axis,

(c) said retention means including an elongated fastener extending between said sections defining a second axis extending parallel to said planes and in a direction generally perpendicular to a radius from said first axis,

(d) said retention means also including a guide pin extending between said sections and defining a third axis extending parallel to said planes and in direction generally perpendicular to said radius, said fastener and pin being spaced apart in the direction of said radius, the pin closer to the first axis than the fastener,

(e) said retention means including abutting ribs on the sections which are locally thickened and form first protruding bosses containing through bores receiving the fastener, said bores located proximate a circle defined by the radially outermost peripheries of the sections, said ribs also being locally thickened to form second bosses containing second bores receiving the guide pin, said second bosses located adjacent said face inner edges which are arcuate, said second bores being closed at the opposite ends of the pin and having equal diameters, whereby the pin is completely enclosed by the abutting ribs and second bosses, said second bosses projecting from said abutting ribs and in opposite directions parallel to said third axis,



(f) said sections including parallel plates defining said opposite faces and defining a space therebetween, and ribs integral with the plates, certain of said ribs extending radially outwardly of said first bosses, the second bosses protruding into open proximity to others of said ribs which project radially inwardly from opposite end portions of the first bosses,

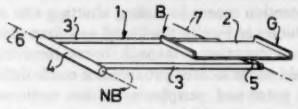
(g) said abutting ribs being everywhere substantially thicker than said other ribs, the fastener being several times longer than the pin, and the overall width of each first boss at locations between the thickened rib and the other rib and in radial directions being about the same as the combined widths, in a direction parallel to said second axis, of said abutting ribs at locations between the first and second bosses, each of said thickened ribs merging with one of said first bosses and one of said second bosses,

(h) there being only one open space between each of said second bosses and one of said first bosses, said space having an open dimension substantially free of ribbing between one of said other ribs and one of said thickened ribs, said dimension being measured in a direction parallel to said second axis, and being everywhere greater than the width of either of said thickened ribs, those portions of said second bosses and of said other ribs closest to said bosses which are closest to said first axis being at substantially the same radial distance from said first axis.

4,120,387
FOOT-OPERATED DEVICE FOR CONTROLLING ENGINE POWER AND BRAKING EFFECT IN MOTOR VEHICLES

Sven Ivar Arne Otteblad, Partille; Hans Erik Osborn Brelen, Skövde; Per Folke Magnus Wistrand, Jönköping, and Svante Ragnar Samuelson, Goteborg, all of Sweden, assignors to AB Volvo, Göteborg, Sweden

Filed Apr. 11, 1977, Ser. No. 786,569
Claims priority, application Sweden, Apr. 9, 1976, 7604223
Int. Cl.[2] B60K *41/20*; G05G *1/14*
U.S. Cl. 192—3 S 9 Claims

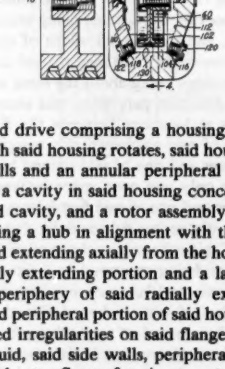


1. A foot-operated device for controlling engine power and braking effect in motor vehicles, characterized in that the device comprises a pedal (2) and a pedal holder (1), said pedal (2) being movably mounted on the pedal holder (1) for controlling the engine power (G) and normal braking (B) with the aid of mutually opposing pedal movements about/along an axis (7; 9; 13; 21; 24; 3) fixed in relation to the pedal holder (1), said pedal holder (1) being movably mounted in the vehicle and adapted to provide emergency braking (NB) on a relatively heavy depression of the pedal (2) in the direction of the lower part of the leg, with the help of the movement of the pedal holder (1).

4,120,388
DRY FLUID DRIVE AND ROTOR THEREFOR

Donald L. Nisley, Mishawaka, Ind., assignor to Reliance Electric Company, Mishawaka, Ind.

Filed Nov. 4, 1976, Ser. No. 738,705
Int. Cl.[2] F16D *23/10*
U.S. Cl. 192—105 A 11 Claims

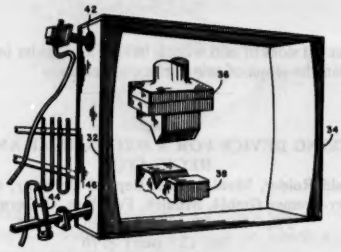


1. A dry fluid drive comprising a housing having a center axis about which said housing rotates, said housing having two spaced side walls and an annular peripheral portion therebetween defining a cavity in said housing concentric therewith, dry fluid in said cavity, and a rotor assembly disposed in said cavity and having a hub in alignment with the center axis of said housing and extending axially from the housing, said rotor having a radially extending portion and a laterally extending flange at the periphery of said radially extending portion spaced from said peripheral portion of said housing, circumferentially arranged irregularities on said flange for engagement with the dry fluid, said side walls, peripheral portion of said housing and said rotor flange forming a restricted area at the periphery of said rotor for containing a continuous mass of dry fluid when the drive is in operation.

4,120,389
PROXIMITY SENSOR

Clifford W. Erickson, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 534,997, Dec. 20, 1974, abandoned. This application Sep. 7, 1976, Ser. No. 721,147
Int. Cl.[2] H04B *9/00*
U.S. Cl. 192—129 A 9 Claims

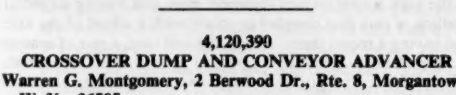


1. Apparatus for protecting a machine operator from a hazardous area of a machine, the apparatus comprising:
- means for generating a spatial distribution of resonant energy interposed between the operator and the hazardous area wherein the means for generating a spatial distribution of resonant energy comprises,
  - beam resonant cavity means wherein the resonant beam cavity means comprises concave curved surfaces facing one another and separated from one another along an axis, and
  - energy source means for introducing energy into the beam resonant cavity means, the energy being resonant in a mathematically describable spatial distribution wherein the energy source means introduces energy into the resonant cavity means at a position not on the axis;
- detector means for sensing energy within the spatial distribution; and
- control means for controlling the machine in response to the detector means.

4,120,390
CROSSOVER DUMP AND CONVEYOR ADVANCER

Warren G. Montgomery, 2 Berwood Dr., Rte. 8, Morgantown, W. Va. 26505

Filed Jan. 3, 1977, Ser. No. 756,489
Int. Cl.[2] B65G *41/00*
U.S. Cl. 198—309 8 Claims



1. A conveyor system having a main conveyor means, a pan line supporting said main conveyor means, and a secondary conveyor means extending cross-wise to and above said main conveyor means and adapted to receive material carried by said main conveyor means, the improvement comprising having a crossover dump including a tunnel portion extending over a portion of said pan line and supporting a part of said secondary conveyor means where said pan line is movable through said tunnel with respect to said crossover dump and said secondary conveyor, an entry ramp extending from said pan line to a position above and to one side of said secondary conveyor means, a reentry ramp extending from a position

above and to one side of said secondary conveyor to said pan line where said entry and reentry ramps support portions of said main conveyor means whereby material conveyed by said main conveyor means is conveyed up said entry ramp to fall onto said secondary conveyor means, and advance means associated with said crossover dump for engaging and moving said pan line in a series of successive incremental movements along its length with respect to said crossover dump.

4,120,391

CONVEYOR SYSTEMS FOR CIGARETTES AND OTHER ROD-LIKE ARTICLES

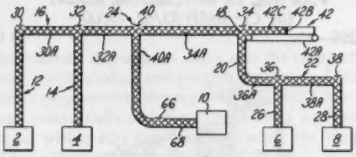
Desmond Walter Molins; Dennis Hinchcliffe, and Peter Alec Clarke, all of London, England, assignors to Molins Limited, England

Filed Oct. 23, 1973, Ser. No. 408,256

Claims priority, application United Kingdom, Oct. 27, 1972, 49787/72

Int. Cl.[2] B65G 43/08

U.S. Cl. 198—347 **55 Claims**



1. A conveyor system for conveying a stack of cigarettes or the like, comprising means defining a channel for the passage of a continuous stack of cigarettes, said channel having a wall formed partly by a conveyor having protrusions at regular intervals on its operative face which contacts the stack of cigarettes during use, and a pulley having a middle part around which the conveyor passes and two coaxial outer parts on opposite sides of the middle part and of a larger diameter than the middle part for guiding the cigarettes in the region of the pulley.

4,120,392

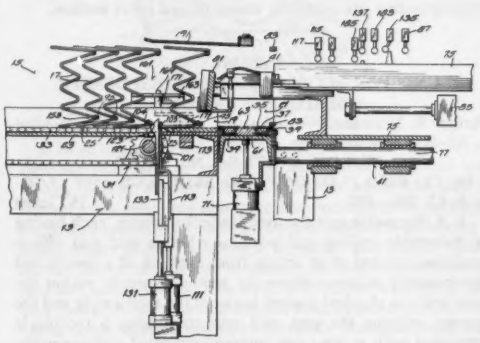
COIL SPRING FEEDING APPARATUS

Helmut Sturm, Kenosha, Wis., assignor to Frank L. Wells Company, Kenosha, Wis.

Continuation-in-part of Ser. No. 545,095, Jan. 29, 1975, Pat. No. 4,050,610. This application Feb. 14, 1977, Ser. No. 768,065

Int. Cl.[2] B65G 15/20, 47/10

U.S. Cl. 198—451 **6 Claims**



4. A coil spring feeding apparatus comprising a frame, a plurality of coil spring magazines arranged on said frame in parallel relation to each other and each having a discharge end, said magazines each being adapted to contain a plurality of coil springs, a conveyor assembly extending transversely of and adjacent to said discharge ends of said magazines for receiving coil springs from said magazines and for transporting the coil springs transversely of and away from said magazine ends, said conveyor including a pair of spaced, parallel endless belts each having a top surface, means for supporting said belts for travel transversely of said magazine ends, drive means for intermittently moving said belts transversely of said magazine ends, an elongated platform having an upper surface, means on said frame supporting said platform between said belts and for movement between a raised position with said platform upper surface generally coplanar with said belt top surfaces and a lower position with said platform upper surface beneath said belt top surfaces, and means for locating said platform in said lower position during belt movements and for locating said platform in said raised position between belt movements, and means for withdrawing the endmost coil springs from said magazines and for transferring the endmost coil springs onto said conveyor assembly between belt movements.

4,120,393

DEVICE OF CONTROLLING INTERVAL OF ARTICLES ON BELT CONVEYER

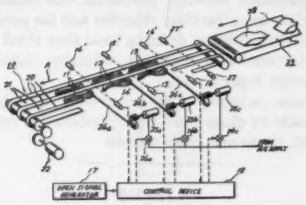
Akira Motooka, Kakogawa, and Takeshi Yoshida, Tatsuno, both of Japan, assignors to Yamato Scale Co., Japan

Filed Jan. 4, 1977, Ser. No. 781,055

Claims priority, application Japan, Jan. 5, 1976, 51-51340

Int. Cl.[2] B65G 47/29

U.S. Cl. 198—460 **1 Claim**



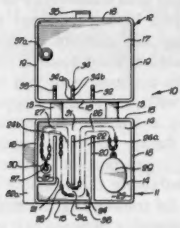
1. A device for controlling the interval of articles fed by a belt conveyer, comprising a belt conveyer including a plurality of conveying belts which are arranged in parallel with lateral gaps therebetween to form a common carrying surface, a plurality of gate devices arranged at intervals along the longitudinal direction under said belts, each of said gate devices including a fork member movably supported under said belts and a fork driving unit for driving said fork member to a position protruding upwardly from said gaps to block passage of said articles by lifting them from the carrying surface in the "CLOSED" state of said gate device and to a position beneath said belts to allow said passage in "OPEN" state thereof, a plurality of article detectors disposed respectively just before said gate devices for sensing said articles on said belts and producing a detection signal when the article is sensed, an opening signal generator for generating a series of opening signals at predetermined intervals, a gate control device for driving the endmost one of said gate devices into the "CLOSED" state in response to the detection signals of the article detector disposed respectively just before said endmost gate device and into "OPEN" state in response to said opening signal and driving the other gate devices into "CLOSED" state in response to the detection signals of the article detectors disposed respectively just before said other gate devices only when the gate immediately downstream is in "CLOSED" state, and an emergency detector disposed before the article detector of the first gate device for interrupting the motion of the belt conveyer when it senses an article and said first gate is in the "CLOSED" position.

4,120,394

CASE FOR CARRYING PENDANT AND CHAIN

Isaac B. Soltes, 1923 S. McPherrin Ave., Monterey Park, Calif. 91754

Filed Aug. 23, 1976, Ser. No. 716,961
Int. Cl.[2] B65D *1/36*
U.S. Cl. 206—45.34 **10 Claims**



1. In combination with a pendant, chain and clasp, a device for storing same comprising

(a) a case including a receptacle and lid and having partitions to define a pendant chamber receiving the pendant, a chain chamber receiving the chain, and a clasp chamber receiving the clasp,

(b) a peg in the clasp chamber removably retaining the clasp, the peg having a free end off which the clasp may be removed,

(c) the chain extending in dual strand configuration generally cyclically between partitions, the chain chamber located between the clasp chamber and the pendant chamber and the partitions defining local slots sized to pass the chain between said chambers, whereby chain strand entanglement is prevented,

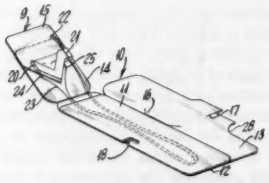
(d) the case including a lid removably assembled to the receptacle to close over the chambers for retaining the pendant, chain and clasp therein.

4,120,395

PACKAGE FOR DOUBLE-ARMED SUTURES

Harvey B. Mandel, North Brunswick, and Eberhard H. Thyen, Middlesex, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Sep. 2, 1977, Ser. No. 830,372
Int. Cl.[2] A61L *17/02*
U.S. Cl. 206—63.3 **21 Claims**



1. A folded package for a double-armed suture comprising

(a) a center panel, a first and second cover panel foldably attached to said center panel along two sides thereof, and a needle mounting panel foldably attached to said center panel along a third side thereof,

(b) needle mounting means on said needle mounting panel,

(c) suture loop retaining means on one of said panels, and

(d) a double-armed suture contained in said package having both needles secured in said needle mounting means and a suture loop substantially equidistant from each needle secured in said suture loop retaining means,

said first cover panel of said package being folded over said center panel with a major portion of said suture enclosed therebetween,

said needle mounting panel being folded over said first cover panel with said needles and needle mounting means enclosed therebetween, and

said second cover panel being folded over said needle mounting panel and first cover panel with said suture loop retaining means enclosed therebetween,

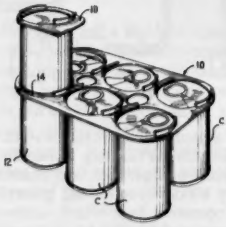
whereby when the second cover panel and needle mounting panel are unfolded from said center panel, said needles and said suture loop are readily accessible and said suture may be cut at said loop to obtain two single-armed sutures of substantially equal length before removing said suture from between said folded panels.

4,120,396

REUSABLE CAN CARRIER WITH CAN ENLOCKING MEANS ON OPPOSITE SURFACES

Carmen T. Mascia, Clarendon Hills, and Gary K. Hasegawa, Chicago, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.

Filed Aug. 16, 1977, Ser. No. 825,241
Int. Cl.[2] B65D *85/62, 75/00*
U.S. Cl. 206—151 **10 Claims**



1. A new article of manufacture comprising a reusable carrier for cans in the form of a sheet of plastics material having opposing surfaces, said sheet having a preselected number of can receiving means projecting from each of said surfaces, each can receiving means of one of said surfaces being in alignment with a corresponding can receiving means of the other of said surfaces, each can receiving means being in the form of a projecting flange cooperating with a portion of said sheet to define a socket for receiving a radial projection carried by an end portion of a can, said flange being interrupted by spaces to form circumferentially spaced arcuate segments, and the flange segments of each can retaining means of said one surface being out of phase with the flange segments of the corresponding can receiving means of said other surface.

4,120,397

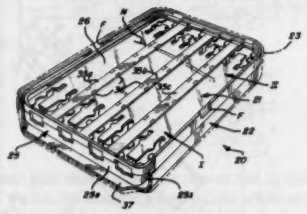
UNIT FOR ACCOMMODATING DISPOSABLE BLADELIKE ARTICLES

Arthur E. Neumann, Winnetka, Ill., assignor to Richard-Allan Medical Industries, Inc., Richland, Mich.

Filed Oct. 4, 1977, Ser. No. 839,387
Int. Cl.[2] B65D *25/00;* B65F *7/00;* A61B *19/02;* A61F *13/00*
U.S. Cl. 206—370 **15 Claims**

1. A disposable unit for used bladelike articles, each having a distortable trailing end portion, wherein said unit effects endwise removal of an article from the tang of a handle and permanently accommodates the removed article within the unit without physical contact between the used article and the person utilizing the unit, said unit comprising a receptacle provided with at least one interior elongated article-accommodating compartment accessible only through an entry formed in at least one end of the compartment, said entry having a configuration for permitting the tang and assembled article to be manually inserted endwise into the compartment

through the entry and only the tang to be manually withdrawn endwise from the compartment through the entry subsequent to the article being removed therefrom, said entry including a first perimetric segment and a second perimetric segment in substantially opposed spaced relation with respect thereto; protruding cam means disposed within said compartment in the path of movement of the tang and assembled article and adjacent said second perimetric segment for engaging and distorting the trailing end portion of the article independently of the tang when the tang and assembled article are manually



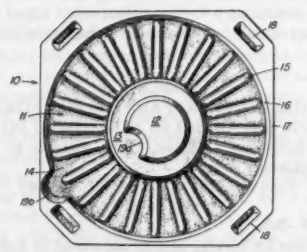
inserted endwise through the entry into the compartment, the distorted article trailing end portion abutting a fixed segment of a first compartment-forming wall and being automatically removed substantially endwise from the tang and permanently entrapped within said compartment when the tang is withdrawn from the compartment through the entry, said fixed first portion of the compartment-forming wall being adjacent to but offset from said cam means and coacting therewith to effect blockage of said entry with respect to the removed article accommodated within said compartment.

4,120,398

PACKAGING SUPPORT STRUCTURE

George Dayman Braddon, Sr., Canandaigua, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 29, 1977, Ser. No. 837,956
Int. Cl.[2] B65D *65/671, 1/34, 21/02*
U.S. Cl. 206—408 **9 Claims**



1. In an improved tray structure for the support of a reel of tape-like film material wound on flat annular hub, said hub having a large outside circumference on which the tape is wound and a relatively smaller inside circumference; said tray being characterized by having a bottom support wall having a raised center portion adapted to fit within said smaller inside circumference of said hub to restrict the lateral movement of said hub across said bottom wall; said bottom wall being further characterized by a first annular zone disposed around said raised center portion and of substantially the same inside and outside diameter of said annular hub, and a second annular zone concentric with said first annular zone and having a thickness profile which is relatively greater than that of said first zone, such that when a roll of said tape-like material is placed on said bottom wall, said first annular zone will support the hub and said second annular zone will support the tape wound on said hub; the improvement comprising;

means in said second annular zone for supporting a roll of the tape-like film material, which tape is substantially more narrow than the hub on which it is wound, comprising a plurality of elevated portions in said bottom wall distributed throughout said second annular zone, the top (portion) of said elevated portions providing a rest surface comprising a plane elevated above the surface of said first annular zone by an amount substantially equal to half the difference between the thickness of said annular hub and the width of said relatively narrow tape-like film material, which elevated rest surface separately supports said reel of said relatively narrow tape in a substantially flat configuration and aids in maintaining the physical integrity of said reel.

4,120,399

REFILLABLE TABLET PACKAGE

John W. Clarke, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 26, 1977, Ser. No. 836,285
Int. Cl.[2] B65D *85/56*
U.S. Cl. 206—474 **6 Claims**

1. A folder in combination with a removable strip of separable pharmaceutical unit doses, said folder comprising a unitary sheet of flexible material forming a cover panel connected to a back panel by a retainer panel, said retainer panel having an upper layer in folded connection with an edge of said cover panel and a lower layer in folded connection with said upper layer and an edge of said back panel, said lower layer overlying said back panel and said upper layer overlying said lower layer to form a pleated construction, said retainer panel having a plurality of spaced holes, said removable strip having a longitudinal stub area defined by a tear line separating said strip into two sections along a longitudinal axis, said stub area being positioned between said retainer and back panel and maintained therein by a plurality of raised projections on said stub area removably interlocked with said retainer panel spaced holes.

4,120,400

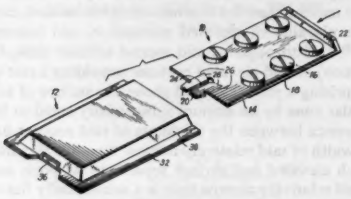
PILL PACKAGE

Bernard Kotyuk, Glendale, N.Y., assignor to Primary Design Group, Inc., New York, N.Y.

Filed Nov. 22, 1976, Ser. No. 743,822
Int. Cl.[2] B65D *85/56*
U.S. Cl. 206—528 **4 Claims**

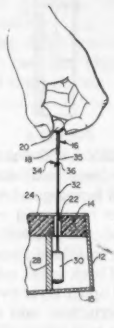
1. A child-proof tablet package for holding tablets comprising a shield member and a card member, said card member including means for receiving said tablets, said shield member having two ends, one end for receiving and removing said card member and the other end defining a lock receptacle opening, said card member further including a pair of locking tabs intergral with said card member and extending beyond one end

thereof, each of said tabs hinged to card member by scored lines and including a locking notch at its side edge, wherein



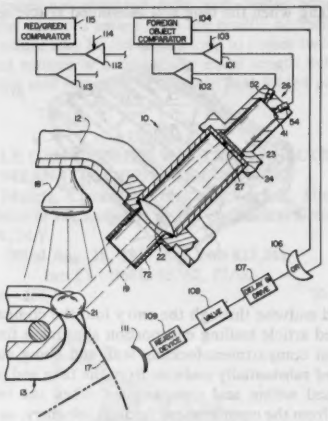
said locking notch engages said shield member at said opening for establishing a locked position with respect to said card member and said shield member.

4,120,401
FINGER RING DISPLAY
Thomas A. Newman, Cranston, R.I., assignor to McGrath-Hamin, Inc., Providence, R.I.
Filed Oct. 25, 1977, Ser. No. 845,414
Int. Cl.[2] B65D *1/34*
U.S. Cl. 206—566 **7 Claims**



1. A jewelry display for finger rings having enlarged ornamental portions and the like, comprising a frame for supporting a display member in turn having a generally planar display surface, said member having a plurality of relatively narrow slots formed entirely therethrough and opening on said display surface, said slots being large enough to permit the frictional receipt of the shank portion of said finger rings, but not large enough for said ornamental portion to pass therethrough, whereby such ornament is retained on said display surface of said display member, a plurality of finger rings disposed within said slots, automatically retractable tether means supported by said frame and positioned behind said slots, and means for connecting the shank portions of each said finger ring to its respective tether means such that each of said finger rings may be grasped and pulled away from said front surface for trial fitting and thereafter automatically retracted to a position adjacent said display surface, said connecting means being characterized in that engagement is made solely with the outer surface of said shank portion, thereby leaving the inner surface of said shank portion completely free and unencumbered.

4,120,402
COLOR SORTER INCLUDING A FOREIGN OBJECT REJECT SYSTEM
Ronald E. Swanson, Sunnyvale, Calif., assignor to Acurex Corporation, Mountain View, Calif.
Filed Jun. 3, 1977, Ser. No. 803,125
Int. Cl.[2] B07C *5/342*
U.S. Cl. 209—75 **7 Claims**

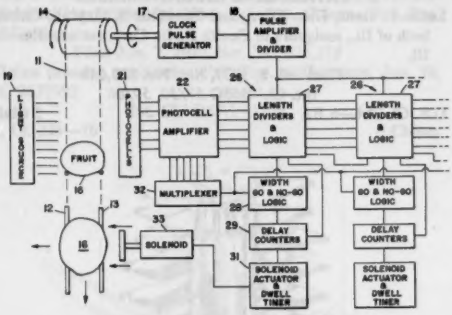


1. A color sorter system for sorting produce and rejecting foreign objects comprising means for causing the produce and objects to be sorted and rejected to pass an inspection station, means at the inspection station for illuminating the produce and objects, means for receiving radiant energy reflected from the produce and objects and forming first and second produce sorting signals and first and second foreign object reject signals, said produce sorting signals being generated responsive to reflected energy at first and second wavelengths and said foreign object reject signals being generated responsive to energy at third and fourth wavelengths, means for comparing said first and second produce sorting signals and generating a produce reject signal when the signals have a predetermined relationship and means for comparing said third and fourth signals and generating a foreign object reject signal when said foreign reject signals have a predetermined relationship.

4,120,403
PHOTOELECTRIC APPARATUS FOR SORTING VARIEGATED ARTICLES ACCORDING TO SIZE
Stephen P. Stephanos, Oakland, Calif., assignor to George E. Lauer, Oakland, Calif.
Filed Jun. 28, 1976, Ser. No. 700,547
Int. Cl.[2] B07C *1/10*
U.S. Cl. 209—564 **11 Claims**

1. Apparatus for sorting objects according to size, comprising a plurality of photosensors arrayed in a column, a light source column disposed parallel to and opposite said photosensor column, conveyor means for transporting said objects between said columns, clock pulse generator means for generating pulses corresponding to a uniform incremental advance of said conveyor means, a plurality of sizing logic circuit means each receiving said clock pulses and the signals from said photosensors and for selecting those of said objects which fall within predetermined length and width criteria, a plurality of impulse devices for removing said selected objects off said conveyor means, said sizing logic circuit means including a plurality of sizing logic circuits, each of said circuits connected with one of said impulse devices, each sizing logic circuit including width counter means, said width counter means including means for selecting the signal of one of said photosensors and determining if said photosensor is interrupted by a

passing object, a first multiplexer for selecting and passing the signal of one of said photosensors, and a minimum width counter actuated by said one photosensor signal passing



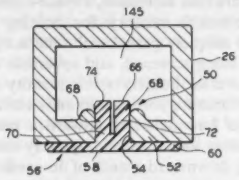
through said first multiplexer and connected to said clock pulse generator means for counting said pulses while said one photosensor is interrupted.

4,120,404

COUPLER SHANK BEARING ARRANGEMENT FOR SUPPORTING RAILROAD CAR COUPLERS ON COUPLER CARRIERS

Osvaldo F. Chierici, Elmhurst, and Richard F. Murphy, Aurora, both of Ill., assignors to Holland Company, Lombard, Ill.

Filed Sep. 30, 1977, Ser. No. 838,162
Int. Cl.[2] B61G 7/10
U.S. Cl. 213—61 **11 Claims**



1. In a railroad car wheeled for riding on track rails and having a body including a center sill projecting from one end of the car and equipped with a coupler striker casting and a coupler mounted on the center sill for swinging movement sidewise of the car and movement longitudinally of the car in response to buff and draft forces acting on the coupler, said coupler including a shank extending through the casting for connection to the sill, with the shank being hollow and defining a lower wall on the underside of same, and a coupler carrier supported by the center sill and having a load support surface on which the coupler shank rests, a coupler shank bearing arrangement interposed between the coupler shank and the coupler carrier, said bearing arrangement comprising:

a bearing structure comprising a body formed from an ultra high molecular weight polymer material of dry self lubricating characteristics,

said body being shaped to define:

a lower generally planar bearing plate portion riding on the coupler carrier and an upper mounting portion upstanding from said bearing plate portion of said body,

said body mounting portion comprising:

a rectilinear ridge structure defining a base section integral with said body bearing plate portion, and

a head section projecting normally of and away from said body bearing plate portion and having a crest extending longitudinally of and substantially paralleling said ridge structure,

said bearing plate portion engaging the coupler shank lower wall on one side of said bearing plate portion,

said ridge structure between said crest and said base section of said body defining an apex portion extending along either side of said ridge structure adjacent said crest and projecting laterally of said ridge structure and at approximately equal levels above said bearing plate portion,

said ridge structure defining a slot extending longitudinally thereof and opening at said crest for the full length of said ridge structure to divide said ridge structure into a plurality of parallel mounting walls extending longitudinally of said ridge structure,

said slot extending through the depth of said ridge structure to approximately said base section thereof,

said coupler shank lower wall being formed to define a slot extending longitudinally of said shank in which said body ridge structure is received,

said coupler shank slot being dimensioned transversely of said coupler shank to substantially complement the transverse dimension of said ridge structure base portion,

said ridge structure at the level of said apex portions having a dimension transversely of said ridge structure that is greater than said coupler shank slot transverse dimension,

said ridge structure slot being dimensioned transversely of said ridge structure such that said walls are spaced from each other along said crest,

said ridge structure apex portions being disposed within the coupler shank,

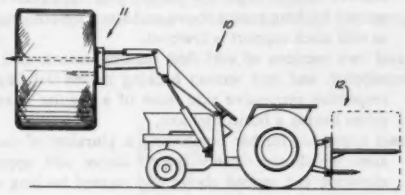
said coupler shank along said slot thereof defining a lip on either side of said slot underlying the respective ridge structure apex portions, whereby said shank lips serve as stops opposing dislodgement of said ridge structure from said shank slot.

4,120,405

SPEAR-TYPE TRACTOR-ATTACHED HAY BALE PICKUP DEVICE

John B. Jones, College Grove, and Robert W. Upton, Pulaski, both of Tenn., assignors to Four Star, Inc., College Grove, Tenn.

Filed Sep. 5, 1975, Ser. No. 610,893
Int. Cl.[2] B65G 67/02
U.S. Cl. 214—1 HH **5 Claims**



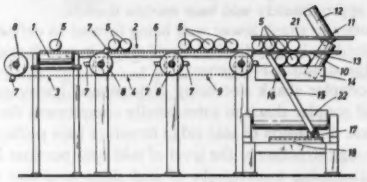
5. A bale handling device for use with a tractor for lifting large roll-type bales comprising: a frame means having one vertical and two horizontal members with the horizontal members securely attached at the top and bottom of said vertical member, securing means for securing said frame to said tractor consisting of two vertical securing bars each of which is slidably attached to each of the horizontal members with one of said securing bars on each side of said vertical member, with each of said securing bars having attachment means in the center thereof for attachment to said tractor, an elongated pointed spear rigidly secured to and projecting forwardly from said frame for insertion into the end of a round bale adjacent the center thereof when the bale is on the ground, a shorter pointed spear detachably secured to and projecting forwardly from said frame, said shorter spear being disposed below the elongated pointed spear and in parallel relation thereto for insertion into the end of a round bale below the center thereof.

4,120,406

APPARATUS FOR FORMING A STACK COMPOSED OF LAYERS OF ROUND-SECTION ELONGATED ITEMS

Herbert Durnig, Linz, Austria, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed May 13, 1977, Ser. No. 796,703
Claims priority, application Austria, May 24, 1976, 3790/76
Int. Cl.[2] B65G 57/22
U.S. Cl. 214—6 N 7 Claims



1. Apparatus for forming a stack composed of layers of round-section elongated items, which comprises

layer-forming means for receiving said items and arranging them in a first plurality of layers in which the number of elongated items increases by one from each layer to the next, and in a succeeding plurality of layers in which the number of elongated items decreases by one from each layer to the next,

a stack support, which is adapted to be lowered from an uppermost elevation in increments equal to the height of one of said layers,

first lateral backing means comprising two sections, which are disposed one above the other and connected to said stack support to move in unison therewith,

second lateral backing means which are horizontally spaced from said first backing means and protrude above and below said stack support and are constrained to move relative thereto in such a manner that the extent of said second backing means above said stack support increases as said stack support is lowered,

said two sections of said first backing means, said stack support, and said second backing means defining four respective successive side faces of a regular hexagonal prism having a horizontal axis,

said apparatus further comprising a plurality of carrying arms which are closely spaced above said uppermost elevation and spaced above said second backing means and adapted to receive each of said layers from said layer-forming means and to support said layer and operable to move therewith to a position over a portion of said stack support which is disposed between said first and second backing means, and then to move out of said position beyond said first backing means in a direction which is parallel to said layer,

said first lateral backing means being arranged to engage each of said layers supported by said carrying arms as they are moved out of said position, so that said layer is held against moving with the carrying arms out of said position and is caused to be deposited on said stack support between said first and second backing means,

said first backing means being adapted to back all said layers thus deposited on said stack support,

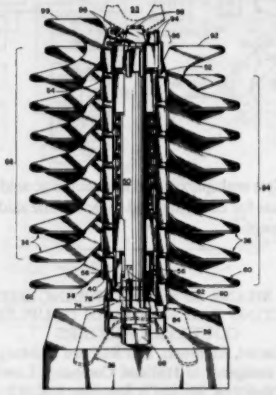
said second backing means being adapted to back said layers of said first plurality thereof which have thus been deposited on said stack support

4,120,407

SPACE-CONSERVATIVE APPARATUS WITH MECHANICAL MEMORY FOR HOLDING AND CATALOGING SHADOW MASKS

Leslie L. Baur, Glen Ellyn, and Thaddeus J. Hajduk, Chicago, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Jul. 5, 1977, Ser. No. 813,048
Int. Cl.[2] B65G 57/30, 59/06
U.S. Cl. 214—6 BA 2 Claims



1. For use in the manufacture of television picture tubes, and specifically for use with an n-station screening apparatus for screening picture tube faceplates, a space-conservative apparatus with mechanical memory for holding and cataloging shadow masks uniquely paired with said faceplates while said faceplates are being screened, said apparatus comprising:

a plurality of mask holders in the quantity $n+1$;

a support column supporting said mask holders and having a first means for ratcheting upward a stack of ascending mask holders and a second, gravity-assisted means for ratcheting downward a stack of descending mask holders;

an up and down reciprocating lower transfer turret supported on the lower end of said support column for removing downward one-at-a-time said mask holders from the bottom of said stack of descending mask holders, for rotating said mask holders to a first position wherein masks are placed upon and/or removed from said mask holders, for rotating said mask holders to a second position below said stack of ascending mask holders, and for bottom loading said mask holders upward one-at-a-time onto said bottom of said stack of ascending mask holders;

an upper transfer turret supported on the upper end of said support column for rotating said mask holders from the top of said stack of ascending mask holders to the top of said stack of descending mask holders;

whereby said mask holders follow a cycle of being bottom loaded onto said stack of ascending mask holders, ratcheted upwards, rotated to said stack of descending mask holders, ratcheted downward, removed downward from the bottom of said stack of descending mask holders, rotated to a predetermined load/unload position and rotated to the bottom of said stack of ascending mask holders;

whereby said apparatus insures in a foolproof way that a one-to-one relationship is retained between said faceplates and said shadow masks when said faceplates are separated from said shadow masks and insure that excessive handling of and the possibility of damage to said shadow masks is prevented.

4,120,408

BRIDGE SCRAPER

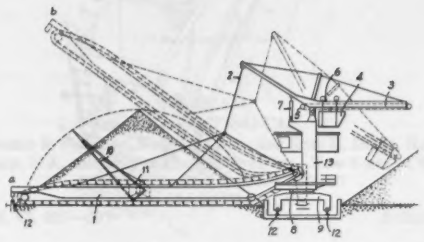
Karl Gehring, St. Ingbert, and Kurt Kamm, St. Ingbert-Hassel, both of Fed. Rep. of Germany, assignors to Pohlig-Heckel-Bleichert Vereinigte Maschinen-Fabriken, Cologne, Fed. Rep. of Germany

Filed Jun. 7, 1977, Ser. No. 804,273

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1976, 2627392

Int. Cl.[2] B65G *65/28*

U.S. Cl. 214—10 8 Claims



1. A bridge scraper for taking bulk material from at least one dump disposed between outer and inner tracks extending on opposite sides of said dump, said bridge scraper comprising

a main frame in wheeled engagement with and movable along said inner track,

a scraper bridge mounted on said main frame for vertical pivotal movement between a raised inoperative position and an operative position, in which said bridge extends generally horizontally and is in wheeled engagement with said outer track,

a scraper chain carried by said bridge and having a lower course which extends along said bridge and in said operative position of said bridge is operable to scrape bulk material from said dump at the base thereof toward said main frame,

slope-breaking means carried by said bridge and engageable with said dump above said base thereof when said bridge is in said operative position,

a rocker mounted on said frame for vertical pivotal movement and having a counterweight arm extending away from said bridge,

a linkage connecting said rocker to said bridge and arranged to hold said counterweight arm in a substantially horizontal position when said bridge is in said operative position and to impart to said counterweight arm a downward pivotal movement as said bridge is raised,

bridge-actuating means operable to move said bridge between said inoperative and operative positions,

counterweight tracks carried by and extending along said counterweight arm,

a counterweight carried by and in wheeled engagement with and movable along said counterweight tracks and adapted to urge said bridge toward said inoperative position, and

control means carried by said rocker and operable to control the movement of said counterweight along said arm,

whereby said counterweight is movable outwardly along said counterweight for an increased mechanical advantage when the bridge is to be raised.

4,120,409

HOPPER BARGE HAVING A BOTTOM DISCHARGE OPENING CLOSABLE BY HOPPER DOORS

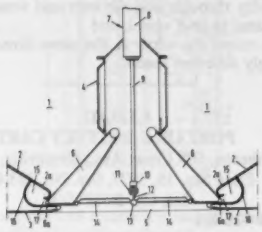
Bartele vander Werff, Medemblik, Netherlands, assignor to A. Vuyk & Zonen's Scheepswerven B.V., aan de IJssel, Netherlands

Filed Feb. 17, 1977, Ser. No. 769,712

Claims priority, application Netherlands, Feb. 23, 1976, 7601808

Int. Cl.[2] B67D *3/00*

U.S. Cl. 214—15 R 5 Claims



1. A hopper barge comprising a hopper including inclined side walls and having a discharge opening, a central keelson box disposed above said opening, suction passage means extending along said discharge opening adjacent one of said side walls, at least one hopper door, control means coupled to said door for moving the door pivotably and in translation between a first position in which said discharge opening is closed and said passage means is blocked, a second position in which the discharge opening is fully open and the door is substantially retracted into the keelson box, and a third position intermediate the first and second positions in which the discharge opening is closed and said passage means is open.

4,120,410

APPARATUS FOR THE SUPPLY OF FUEL POWDER TO A GAS-PRESSURIZED VESSEL

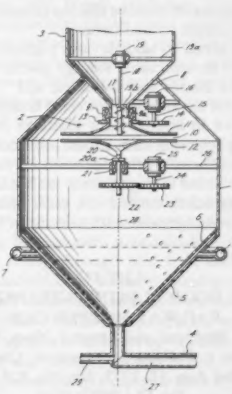
Maarten J. van der Burgt, The Hague, Netherlands, assignor to Shell Internationale Research Maatschappij B.V., The Hague, Netherlands

Filed Jul. 27, 1977, Ser. No. 819,366

Claims priority, application Netherlands, Sep. 13, 1976, 7610130

Int. Cl.[2] B65G *65/30*

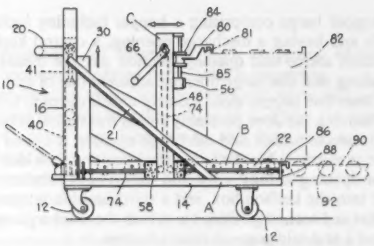
U.S. Cl. 214—17 B 5 Claims



1. An apparatus for the supply of fuel powder to a gas-pressurized vessel, comprising:

a centrifugal pump for supplying powder to the vessel;
means for mounting said centrifugal pump in the vessel for injecting powder into the vessel by centrifugal force;
a supply tube for the supply of powder from outside of the vessel to the centrifugal pump;
the axis of rotation of the centrifugal pump coinciding with the center line of the supply tube;
said pump comprising two rotatably mounted trays positioned in said vessel and having a discharge slit in the area between said trays;
said supply tube being in communication with area between said trays for flowing the powder from the supply tube outwardly through said slit into said vessel as said trays are rotated in said vessel; and
means to rotate the trays in the same direction at a small relatively different speed.

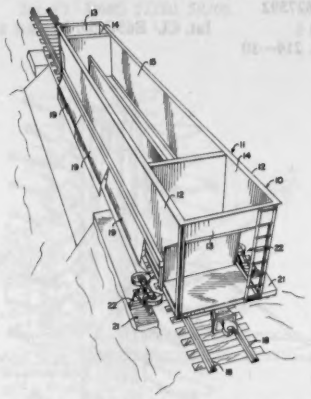
4,120,411
PORTABLE BATTERY CART
Bobby L. Johnson, 508 Crane Ave., Greenville, S.C. 29611
Filed Sep. 15, 1977, Ser. No. 833,495
Int. Cl.[2] B60P *1/32*
U.S. Cl. 214—38 BA **7 Claims**



1. A portable battery cart for transporting electrical batteries comprising:
a wheeled base frame including a pair of laterally spaced vertical members adjacent one end thereof;
an elevator platform carried by said vertical members of said base frame in a cantilevered manner;
lift means for moving said elevator platform vertically relative to said base frame;
movable frame means carried by said elevator platform including a pair of laterally spaced vertical legs with a cross member extending therebetween;
latch means carried by said movable frame means being vertically movable relative thereto releaseably connecting said frame means to said battery;
hook means carried by said elevator platform for connecting said cart to an associated storage platform whereon said batteries are loaded and unloaded; and
drive means for moving said movable frame means horizontally relative to said elevator platform including a chain belt having opposing ends affixed adjacent the ends of said elevator platform, a drive sprocket carried by said movable frame means in engagement with said chain belt, and an idler sprocket carried on each side of said drive sprocket in engagement with said chain belt.

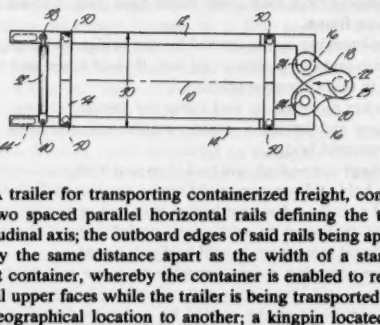
4,120,412
TRACKSIDE DOOR CLOSING ARRANGEMENT FOR RAILWAY HOPPER CARS
Roy W. Miller, Highland, and Ernest J. Nagy, Munster, both of Ind., assignors to Pullman Incorporated, Chicago, Ill.
Filed Aug. 12, 1977, Ser. No. 823,884
Int. Cl.[2] B61D *7/30*
U.S. Cl. 214—63 **9 Claims**

1. For a railway hopper car having a longitudinally extending discharge door hingedly mounted on the car for movement laterally outwardly from closed to open position relative to a discharge opening, the improvement comprising:
a trackside operating mechanism including a base positioned to one side of a railway track,
an upright pedestal mounted on said base,
a horizontal arm pivotally mounted on said base for swinging movement on a vertical axis,



wheel means including a pair of wheels longitudinally spaced on said arm for pivotal movement about vertical axis,
means connected to one wheel for imparting rotation of said one wheel to said other wheel,
said wheel means being positioned to engage the side of an open door of said hopper car traveling along the side of said trackside operating mechanism thereby swinging said door inwardly toward said car to a closed position.

4,120,413
SELF LOAD/UNLOAD TRANSPORTER
William G. Harris, and Jerome T. Cipkowski, both of Warren, Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed May 31, 1977, Ser. No. 801,710
Int. Cl.[2] B60P *1/54*
U.S. Cl. 214—394 **1 Claim**



1. A trailer for transporting containerized freight, comprising: two spaced parallel horizontal rails defining the trailer longitudinal axis; the outboard edges of said rails being approximately the same distance apart as the width of a standard freight container, whereby the container is enabled to rest on the rail upper faces while the trailer is being transported from one geographical location to another; a kingpin located forwardly of the rails on the trailer axis; a separate swingable link connecting the kingpin to the front end of each rail; said kingpin being capable of attachment to a tractor so that when the tractor is driven in a reverse direction the kingpin will cause the rear ends of the links to swing outwardly, to thereby shift the front ends of the rails away from one another; a fluid cylinder means trained between the rails near their rear ends, said fluid cylinder means being actuable to shift the rear ends of the rails away from one another, whereby the rails then define

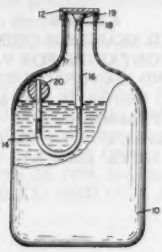
a circumscribed space wider than a standard freight container; said fluid cylinder means having a swingable connection with one of the rails and a detachable connection with the other rail, whereby said fluid cylinder means can be swung to a non-obstruct position paralleling said one rail when it is desired to drive the trailer to or from a position straddling a ground-contacting freight container; a first container lift means spanning the rails near their front ends, and second container lift means spanning the rails near their rear ends; each container lift means being of inverted U configuration, whereby the trailer can be driven to or from a position straddling a ground-contacting freight container without interference from the lift means; each lift means including an expansible-contractible beam that changes length while the rails are being adjusted toward or away from one another.

4,120,414

SELF-VENTING CAP

Thomas S. Harrison, Deer Isle, Me., and Ross L. Doyle, Ramsey, N.J., assignors to Sterling Drug Inc., New York, N.Y.

Filed Sep. 2, 1977, Ser. No. 830,107
Int. Cl.[2] B65D *51/16*
U.S. Cl. 215—307 **5 Claims**



1. The combination of a liquid container with a self-venting cap wherein said cap includes a rigid tube extending to approximately the geometrical center of the container, a free-ended flexible tube in extension of the rigid tube, and a float on the flexible tube at its free end, the length of the flexible tube being sufficient to cause the float to closely approach the inside of the container at all points regardless of the relative position of the container, so that the float holds the end of the tube above liquid level at any position of the container providing for venting of any gas pressure generated from the contained liquid.

4,120,415

REFUSE CONTAINER

Donald J. Hopkins, Knoxville; John C. Salyers, Oak Ridge, and Paul L. Goranson, Knoxville, all of Tenn., assignors to Carrier Corporation, Syracuse, N.Y.

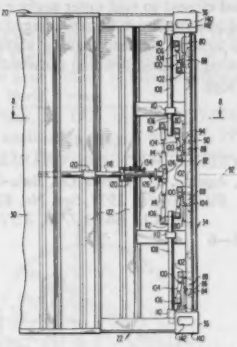
Division of Ser. No. 641,371, Dec. 17, 1975, Pat. No. 4,044,914. This application May 19, 1977, Ser. No. 798,733
Int. Cl.[2] B65D *00/00, 45/00*
U.S. Cl. 220—1 T **8 Claims**

1. In a refuse container having walls, a bottom frame, and an end closure, an improved latching apparatus comprising:

complementary connector means on the end closure and the container;

one of said complementary connector means operable between an engaged position and a released position; and

actuating means operatively connected to the one connector means, having an over-center mechanical lock and operable to operate the one connector means between the engaged and released positions thereof.

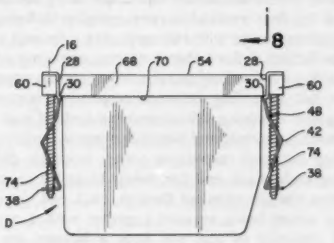


4,120,416

MOUNTING BRACKET FOR ELECTRICAL BOXES

Eugene J. Suk, Pittsburgh, Pa., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Nov. 26, 1976, Ser. No. 745,396
Int. Cl.[2] H02G *3/08*; G12B *9/00*
U.S. Cl. 220—3.4 **5 Claims**



1. An electrical box including peripheral and rear walls defining a cavity having an opening with a peripheral edge, opposite bosses extending outwardly from said peripheral wall adjacent said peripheral edge, bracket mounting screw receiving holes through said bosses extending along screw axes substantially perpendicular to the plane of said opening, said bosses having front surfaces facing in the same direction as said opening and oppositely facing rear surfaces, said bosses having opposite side surfaces extending between said front and rear surfaces, a mounting bracket positioned adjacent each said boss for mounting said box within an opening in a wall, each said bracket including a base positioned adjacent said rear surface and having a screw receiving opening aligned with said bracket mounting screw receiving hole, a deformable portion extending from said base generally along a portion of said peripheral wall toward said rear wall and having a flange with a screw receiving bore aligned with said hole and opening, a screw extending freely through said hole and opening and being threaded into said bore so that tightening of same moves said flange toward said base and deforms said deformable portion outwardly away from said peripheral wall, said screw also holding said bracket to said box by extending through said hole and opening and being threaded into said bore, spaced-apart opposite legs extending from said base along said opposite sides of said boss closely adjacent thereto, wings extending outwardly from said legs adjacent said peripheral edge of said opening, said peripheral wall of said box having shoulders on the outer surface thereof at least on opposite sides of said

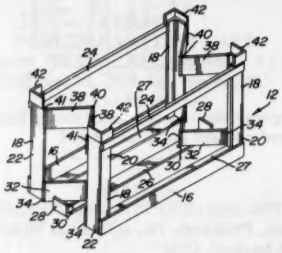
bosses and spaced toward said rear wall from said opening, and hook portions extending rearwardly closely adjacent said outer surface of said box peripheral wall from the edges of said wings located closest to said outer surface of said box peripheral wall and terminating in hooks engaged over said shoulders to hold said bracket against rocking about said boss and to stiffen said wings against bending outwardly of said box relative to said legs.

4,120,417

SYSTEMS WITH DISPOSABLE TRAYS

Salvatore A. Aquino, 337 Trevor La., Bala-Cynwyd, Pa. 19004

Filed Aug. 8, 1977, Ser. No. 822,508
Int. Cl.[2] B65D *7/24, 25/14*
U.S. Cl. 220—6 **4 Claims**



1. In combination, a collapsible crate and a disposable tray positioned within said crate, said crate being rectangular and bounded by four vertical corner uprights defining the four corners of said crate with two opposing sides and two opposing ends further defined therebetween, opposing sides of said crate having a lower horizontal side bar and an upper horizontal side bar extending between respective corner uprights defining said opposing sides, opposing ends of said crate having a lower horizontal end bar and an upper horizontal end bar extending between respective corner uprights defining said opposing ends, each end bar being hingedly secured to the respective upright adjacent thereto, each end bar comprising two bar pieces being secured together with a central hinge located centrally of said end bars, a bottom bar extending generally parallel to said side bars, said bottom bar having slot means with said central hinge of each said lower end bar being slidable in said slot means, said bottom bar being slidably connected to each said lower end bar and said crate being collapsible to bring the side bars closer to each other to the extent each said central hinge is slidable in said slot means except when said disposable tray is positioned within said crate and rests upon said bottom bar.

4,120,418

METHOD OF PRODUCING A BARRIER IN A THERMALLY INSULATED CONTAINER

Michael H. Collins, Huxley, Nr. Chester, and Jeremy D. Le Hardy Guiton, Chichester, both of England, assignors to Shell Internationale Research Maatschappij B.V., Netherlands

Filed Jun. 4, 1976, Ser. No. 693,215
Claims priority, application United Kingdom, Sep. 30, 1975, 39982/75
Int. Cl.[2] B65D *25/18*
U.S. Cl. 220—444 **3 Claims**

1. A method of producing a barrier in a thermally insulated container lined with polyurethane foam for storage or transport of liquefied gases, comprising the steps of:

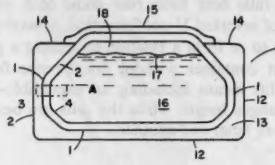
cutting or grinding an inner surface of polyurethane foam previously applied onto an inner surface of a container rigid outer shell to obtain a substantially flat cut or ground surface of polyurethane foam;

applying a first layer of an epoxy resin formulation, comprising an epoxy resin and a curing agent, onto the polyurethane foam cut or ground surface;

allowing the epoxy resin formulation first layer to gel;

applying a second layer of an epoxy resin formulation, comprising an epoxy resin and a curing agent, onto the gelled first layer;

applying a layer of glass-fiber material onto the second layer



when the epoxy resin formulation of the second layer is still wet;

compacting the glass-fiber material into the second layer;

applying a third layer of an epoxy resin formulation, comprising an epoxy resin and a curing agent, onto the second layer; and

allowing the epoxy resin formulations of the second and third layers to gel.

4,120,419

HIGH STRENGTH SEAMLESS CHIME CAN BODY, SHEET METAL CONTAINER FOR VACUUM PACKS, AND MANUFACTURE

William T. Saunders, Weirton, W. Va., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed Feb. 23, 1976, Ser. No. 659,995
Int. Cl.[2] B65D *7/42*
U.S. Cl. 220—66 **3 Claims**

1. Sheet metal can body having a seamfree sidewall symmetrically spaced from a central longitudinal axis defining an open end and having a unitary endwall joined to the sidewall at its remaining opposite longitudinal end by a seam-free reinforced chime juncture, such can body being for use in a sealed two-piece can in which the reinforced chime juncture and unitary endwall are able to withstand both vacuum packing and the internal pressure of food processing without permanent distortion,

such reinforced chime juncture comprising

channel means disposed about a peripheral portion of the can body endwall contiguous to the sidewall,

such channel means including an outer channel, and

an inner channel contiguous to and radially inward of the outer channel,

each such channel opening in a longitudinal direction to present a toroidal configuration when viewed axially,

such channels being defined by a plurality of wall portions of such can body sheet metal disposed in radially spaced relationship to each other and with the major directional component of each wall portion being longitudinal of the can body,

such plurality of wall portions including an outer wall, an intermediate wall, and an inner wall,

the outer wall comprising a portion of the sidewall contiguous to the endwall,

the intermediate wall being located radially inwardly of and joined to the outer wall so as to define with the outer wall such outer channel,

the outer channel having a U-shaped configuration in radial cross-section with such U-shaped configuration opening toward the interior of the can body,

the inner wall being disposed radially inwardly of and joined to the intermediate wall so as to define with the intermediate wall such inner channel,

such inner wall extending longitudinally a dimension equal to at least half that of a corresponding longitudinal dimension of the intermediate wall,

the inner channel having a U-shaped configuration in radial cross section with such U-shaped configuration opening toward the exterior of the can body and defining an apex at its closed end,

the unitary endwall including a panel portion extending laterally from such inner wall toward the central longitudinal axis,

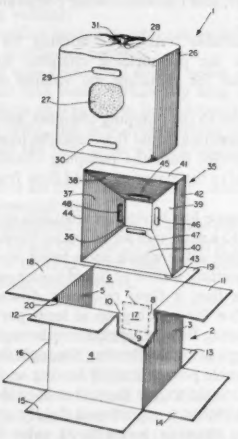
such endwall panel including a centrally located substantially planar disc circumscribed by at least one reinforcing ring profile means,

such endwall panel being capable of flexing to enable longitudinal movement of its central point along the central longitudinal axis, with such flexing action changing the longitudinal orientation of the inner wall about the apex of the inner channel such that the inner wall at its longitudinal end opposite to such apex can be moved in a radial direction without permanent distortion of chime juncture and contiguous sheet metal.

4,120,420
LINED PARALLELEPIPEDAL PACKAGE FOR DISPENSING FLOWABLE MATERIALS

Robert S. Dirksing, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 16, 1978, Ser. No. 878,367
Int. Cl.[2] B65D *25/14, 5/70*
U.S. Cl. 220—416 **10 Claims**

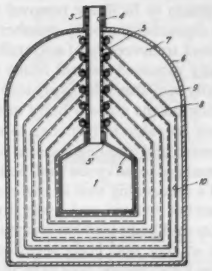


1. A parallelepipedal dispensing package comprising a carton having a plurality of sidewalls and top and bottom closure means, a funnel, a bag-type liner for housing a predetermined quantity of flowable material, said funnel having an outlet end juxtaposed an inwardly facing surface of one of said sidewalls, the interior surface of said funnel having a sufficient degree of taper with respect to the nominal angle of repose of said flowable material that substantially all of said flowable material can gravitate from said package when said package is oriented with said funnel pointing downwardly and when the portions of said liner and said one sidewall which span the outlet end of said funnel are breached.

4,120,421
CONTAINERS FOR CRYOGENIC LIQUIDS

Roger Prost, Saint Egreve, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Mar. 15, 1977, Ser. No. 777,934
Claims priority, application France, Mar. 25, 1976, 76 08651
Int. Cl.[2] B65D *25/18;* F17C *13/00*
U.S. Cl. 220—423 **7 Claims**

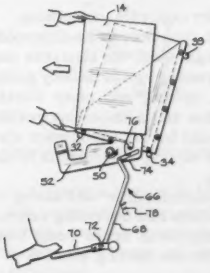


1. In a container for liquified gases, which comprises an inner container to hold the liquified gas, said inner container comprising a container body and an elongated neck, and an outer shell spaced away from the said inner container, said shell forming with said inner container an evacuated insulating space packed with material made up of superimposed pairs of layers of materials, each pair of layers consisting of a conductive foil and an insulating sheet, marginal portions of each pair of layers being in individual thermal contact with the neck of the inner container along annular areas spaced from one another along said neck, said neck extending to said outer shell; the improvement in which the neck of the inner container is made from a plastic material, the said thermal contact between each pair of layers and the neck being achieved by means of an annular part which presses said marginal portion of each pair of layers directly onto said neck.

4,120,422
SYSTEM FOR STORING AND TRANSPORTING FLAT BOARD-LIKE ELEMENTS

Robert L. Propst, and Paul L. Propst, both of Ann Arbor, Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Filed Nov. 8, 1976, Ser. No. 740,054
Int. Cl.[2] B65G *1/04*
U.S. Cl. 221—88 **7 Claims**



1. A rack for storing and transporting flat board-like elements of predetermined thickness, such as printed circuit

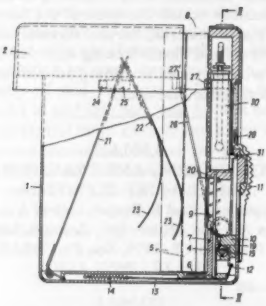
boards, said rack comprising a main frame, a plurality of upright partition members mounted on said frame in uniformly spaced positions in which said partition members define a plurality of side-by-side stalls, each of said stalls being of a width slightly greater than said predetermined thickness to accommodate one of said elements in an upright position therein, element support means on said frame operable to support a plurality of said elements in upright positions in said stalls, said element support means comprising support members assembled with said partition members so as to be in fixed positions with respect to said partition members and being spaced to provide for said elements being edgewise accessible in said stalls, means operable to extend into a stall and engage the edge of an element therein for the purpose of moving said element in a direction to facilitate removal thereof from said stall, said means comprising a body member mounted on said frame for movement transversely of said stalls, said body member being pivotally mounted on said frame so that said body member is pivotally movable selectively into a plurality of said stalls, and coacting means on said body member and on said partition members operable in response to movement of said body member toward and into engagement with at least one of said partition members to advance said body member in one direction toward a succeeding stall so that repeated movement of said body member toward and away from said partition members advances said body member transversely of said stalls in one direction so that said body member is positioned in alignment after each succeeding stall to facilitate removal of an element from each of said stalls.

4,120,423

CIGARETTE DISPENSER

Rudolf Frühwirth, Klusemannstrasse 4, 8053 Graz, Austria

Filed Jun. 9, 1977, Ser. No. 804,873
Claims priority, application Austria, Jun. 10, 1976, 4245/76
Int. Cl.[2] B65G *59/00*
U.S. Cl. 221—115 **12 Claims**



1. A dispenser for cigarettes, comprising:

a casing for the cigarettes to be dispensed and having an opening through which the cigarettes may be dispensed,

at least two dispensing means slidably guided in said casing towards said opening and away therefrom between a starting position and a dispensing position, each of said dispensing means having a protrusion adapted to underlie a cigarette for moving that cigarette towards said opening of said casing,

a transporting mechanism in said casing which urges the cigarettes towards said dispensing means,

each of said dispensing means being loaded by resilient means towards the starting position of said dispensing means,

a slider means slidably guided in said casing towards said opening and away therefrom by hand between a starting position and a dispensing position,

a further resilient means for resiliently urging said slider means towards its starting position,

a cam means rotatably mounted in said slider means and having a number of cam surfaces corresponding to the number of dispensing means, said cam surfaces being displaced with respect to each other, seen in circumferential direction of the cam means,

a protrusion provided on each of said dispensing means for co-operation with one of said cam surfaces,

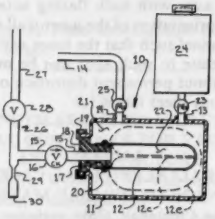
said slider means being slidably movable beyond said dispensing position towards said opening of said casing, said cam means being rotated when said slider means is moved beyond said dispensing position.

4,120,424

LIQUID DISPENSING PUMP

Alfred E. Zygiel, deceased, late of Dallas, Tex., by Mary E. Zygiel, heiress and devisee, assignor to The Cornelius Company, Golden Valley, Minn.

Filed Dec. 2, 1976, Ser. No. 748,242
Int. Cl.[2] B67D *5/56*; G01F *11/08*
U.S. Cl. 222—133 **1 Claim**



1. A liquid dispensing pump powerable by a pressurized liquid, comprising:

(a) a pump housing having therein a pumping and pressurizing chamber, said chambers being physically divided from each other;

(b) means movable within the housing for transferring a pressure in the pressurizing chamber to the pumping chamber and for reducing the volume of the pumping chamber;

(c) a liquid inlet to the pumping chamber, said inlet having a valve for directing liquid flow into the pumping chamber;

(d) a liquid outlet from the pumping chamber, said outlet having a valve for directing liquid flow from the pumping chamber;

(e) a liquid source line having an upstream end adapted to be connected to a source of liquid under pressure, a normally closed control valve which upon being opened and operable for permitting a flow of liquid under pressure through said source line, a flow restrictor downstream of said control valve for backing up at least part of the source pressure during flow of liquid therethrough, and an outlet for discharge of liquid flowing through said restrictor;

(f) a pressurizable power conduit having an inlet end fluidly connected to said source line in between the control valve and the restrictor, a second end fluidly connected to the pressurizing chamber, and a check valve for permitting a flow of liquid under pressure from said source line through the conduit to the pressurizing chamber and for precluding reverse flow of liquid from the pressurizing chamber back to the source line from whence the liquid came; and

(g) an open drain fluidly connecting the pressurizing chamber to atmosphere, said drain being sized with respect to said power conduit to form a greater restriction to flow of power liquid therethrough than does said power conduit, for permitting flow of power liquid through the drain during an operative pressurization of the pressurizing

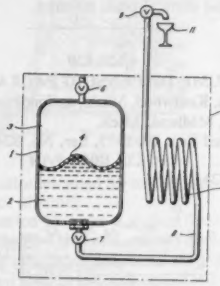
chamber of only a fractional portion of the power liquid passing through said power conduit during such pressurization, and for draining from said pressurizing chamber the remainder of the power liquid passed through said power conduit during such operative pressurization, upon termination of an operative pressurization of said power conduit, said drain being a capillary aperture sized for retaining by capillary action a prime of liquid within the power conduit and pressurizing chamber.

4,120,425

APPARATUS FOR DISPENSING SPARKLING WINES

George M. Bethurum, Pasadena, Tex., assignor to The Champagne Machine Inc., Pasadena, Tex.

Continuation of Ser. No. 285,563, Sep. 1, 1972, abandoned. This application Jun. 25, 1976, Ser. No. 699,955
Int. Cl.[2] B67D *5/62*
U.S. Cl. 222—146 C **2 Claims**



1. An apparatus for dispensing sparkling wine without foaming or going flat, comprising;
   - a storage vessel including an inert flexible diaphragm subdividing vessel into a gas containing portion and a sparkling wine containing portion, said portions being inversely variable in volume;
   - a throttling orifice having its inlet connected to the vessel in the liquid containing portion;
   - an elongated tube connected to the outlet of the throttling orifice, said tube being sufficiently long that the gradual pressure drop as wine flow therethrough prevents frothing of the wine, the flow cross-section of the tube being greater than the flow cross-section through the throttling orifice;
   - an on-off valve on the end of the tube where the sparkling wine is dispensed; and
   - wherein the elongated tube has an inside diameter of about ¼ inch and a length of about 30 feet; and is curled into a coil for a major portion of its length between the throttling orifice and the on-off valve.

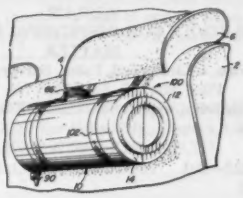
4,120,426

LIQUID CARRIER AND DISPENSER APPARATUS FOR VEHICLES

William J. Grubbs, 2041 S. Kolb Rd., Tucson, Ariz. 85710

Filed Feb. 10, 1977, Ser. No. 767,527
Int. Cl.[2] B67D *5/60, 5/62*
U.S. Cl. 222—183 **11 Claims**

1. Liquid carrier and dispenser apparatus for vehicles, comprising, in combination:
   - container means having an interior for holding a quantity of liquid and having a longitudinal axis disposed in a generally horizontal orientation, and a first end and a second end equally perpendicular to the longitudinal axis;
   - insulation means disposed about the container means;
   - an end cap disposed at and removably secured to the first end of the container means for sealing the end of the container means when secured thereto and for providing access into the interior of the container means when removed therefrom;
   - a filler boss extending upwardly from the container means substantially perpendicular to the longitudinal axis of the container means and communicating with the interior of the container means for filling the container means with a liquid;
   - cap means removably secured to the filler boss for providing access into the interior of the container means when removed therefrom and for venting the interior of the container means as liquid is drained from the interior of the container means, including



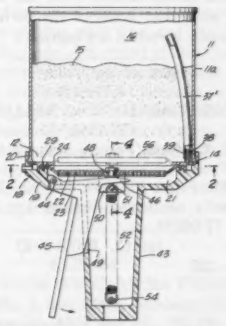
   - a cylindrical portion,
   - an end wall disposed at one end of the cylindrical portion and including a first aperture extending therethrough,
   - an insert secured to the cylindrical portion and including a second aperture extending therethrough, and
   - a spacer disposed between the end wall and the insert to prevent direct communication between the first and the second apertures; and
   - spigot means for selectively draining liquid from the container means.

4,120,427

POWDER GUN

John W. McRoskey; Leonard H. McRoskey, both of Los Angeles, and Delbert D. Swartz, Torrance, all of Calif., assignors to Republic Tool & Manufacturing Corp., Los Angeles, Calif.

Filed Dec. 29, 1976, Ser. No. 755,219
Int. Cl.[2] B05B *11/04*
U.S. Cl. 222—193 **8 Claims**



5. A powder dispersing device comprising the combination of:
   - (a) a container containing a powder to be dispersed;
   - (b) a movable wall connected with an open outlet end of said container and being movable toward and away from said container whereby the volume of said container is decreased and increased;
   - (c) an outlet chamber;
   - (d) communication means connecting said outlet chamber to the interior of said container independently of said mov-

able wall whereby when said movable wall is moved toward said container air will flow from said container through said communication means and through said outlet chamber;

(e) means including openings connecting said chamber with the open end of said container, said powder moving through said openings and into said chamber when air is forced through said chamber;

(f) an outlet from said chamber through which air flows carrying with it the powder which has moved into said chamber; and

(g) means for moving said movable wall.

4,120,428

HAND TOOLS FOR DISPENSING PARTICULATE MATTER

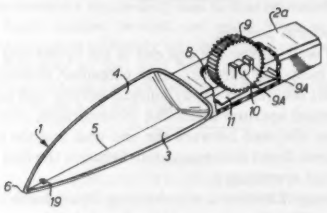
Frank Boram, 6 Littlemead, Esher, Surrey, England

Filed Mar. 17, 1977, Ser. No. 778,373

Claims priority, application United Kingdom, Apr. 8, 1976, 143778/76

Int. Cl.[2] B65D *83/06*

U.S. Cl. 222—201 **11 Claims**



2. A hand tool for dispensing particulate matter comprising

a scoop having two walls arranged in generally V-shaped configuration for containing the particulate matter,

a handle rigid with the scoop,

vibration-generating means housed in the handle operable to vibrate the scoop and so progressively drive the particulate material towards the end of the scoop remote from the handle, and

a barrier secured to the two walls of the scoop adjacent the end of the scoop remote from the handle arranged to separate individual items of the particulate matter as it progressively traverses the barrier.

4,120,429

DISPENSING PUMP HAVING BELLOWS METERING CHAMBER

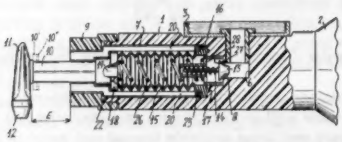
André Vignot, Coubron, France, assignor to Societe Prodene, Vaujours, France

Filed Apr. 20, 1977, Ser. No. 789,432

Claims priority, application France, Apr. 23, 1976, 76 11999; Jan. 6, 1977, 77 00234

Int. Cl.[2] B67D *5/42*

U.S. Cl. 222—207 **16 Claims**



1. A device for dispensing metered amounts of liquid or pasty products, which comprises

a chamber communicating through a pair of valve means on the one hand with an orifice opening into a reservoir containing the product to be dispensed, and on the other hand with an outlet nozzle,

a delivery and suction member disposed within said chamber and consisting of a tube of resilient material pleated accordion-like and having one end engaging in a fluid-tight manner the edge of an inlet orifice opening into said chamber,

a control push member comprising a hollow stem rigid with the other end of said tube of resilient material, said push member also incorporating said outlet nozzle for ejecting the product,

a return spring disposed internally of said pleated tube and constantly urging said pleated tube and push member to their inoperative positions, and

a rigid sleeve coaxial to and enclosing said resilient pleated tube, one end of said sleeve engaging the tube end held in a fluid-tight manner against the edge of the inlet orifice of the chamber of the device, the other end of said sleeve being rigid with the corresponding end of said chamber adjacent said control push member.

4,120,430

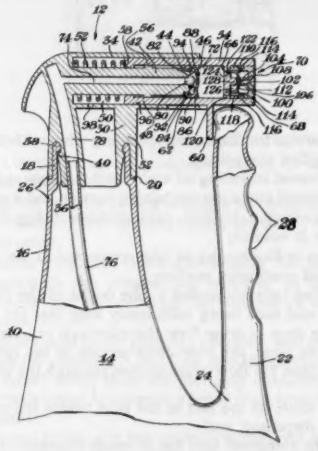
PUMP DISPENSING PACKAGE

Floyd R. French, Kentwood, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 19, 1977, Ser. No. 834,606

Int. Cl.[2] B05B *9/04*

U.S. Cl. 222—324 **2 Claims**



1. The combination comprising an actuator integrally formed in a blown plastic bottle, the actuator having a first end flexibly and pivotally joined to the bottle, and a second end spaced from the bottle a distance such that the bottle is adapted to define a back hand rest while the fingers of the hand may be extended to grip the actuator, said actuator being operatively associated with a dispensing pump having connection to the bottle.

4,120,431

TIP SEAL DISPENSER VALVE FOR A PRESSURIZED CONTAINER

Robert S. Schultz, Old Greenwich, Conn., assignor to The Risdon Manufacturing Company, Naugatuck, Conn.

Filed Jan. 28, 1977, Ser. No. 763,412

Int. Cl.[2] B65D *83/14*

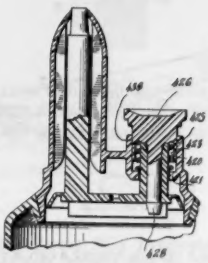
U.S. Cl. 222—518 **8 Claims**

1. A tip seal dispenser valve for a pressurized container of a viscous product, said valve comprising:

A. a valve body, mountable with the container, including

1. a hollow valve channel, in fluid communication with the interior of the container, having a major axis and defining an outlet orifice at its outer end,
2. a hollow actuator channel, laterally displaced from said valve channel, having a major axis parallel to the major axis of said valve channel,
3. a metering cylinder with which both said valve channel and actuator channel communicate,

B. a valve core having a tip mounted for axial reciprocal movement in said valve channel between a closed position with said core tip blocking said outlet orifice and an open position with said core tip withdrawn from said outlet orifice,



C. an actuator button mouned for axial reciprocal movement in said actuator channel,

D. a piston mounted to make a sliding fit in said metering cylinder and thereby being interposed between said outlet orifice and the interior of the container and further interconnecting said valve core and actuator button to effect and guide movement of said valve core in said valve channel between said closed and open positions when said actuator button is moved, said piston having metering orifice means offset with respect to the outlet orifice through which a major portion of the viscous product passes when moving from the interior of the container to said outlet orifice to be dispensed therefrom under pressure.

4,120,432

CASTOR

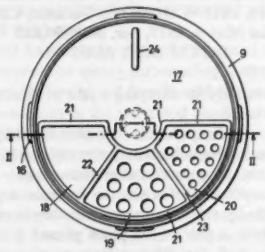
Dieter Fuchs, Westring 15-17, 4503 Dissen T.W., Fed. Rep. of Germany

Filed Aug. 19, 1976, Ser. No. 715,688

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1975, 7527172[U]

Int. Cl.[2] A47G *19/24*

U.S. Cl. 222—565 **4 Claims**



1. A castor for pulverous, granular or lumpy substances such as spices, comprising in combination:

(a) a cylindrical hollow body having an opening;

(b) a cylindrical cap insert adapted to be matingly received by said hollow body and having a portion extending across said opening when said cap insert is mounted in said hollow body, said portion having a main aperture, said cap insert having an externally threaded neck therein;

(c) a cylindrical lid adapted to be mounted on said cap insert and having an internal threaded portion which is adapted to threadably engage said neck of said cap insert;

(d) a cylindrical cover slide rotatably mounted within said cap insert, said cover slide having a sieve plate and wall means projecting from said sieve plate which surround and separate a plurality of perforate regions in said sieve plate and are adapted to coact with the underside of said lid to effectively separate and seal from each other the perforate regions of said sieve plate when the lid is fully mounted on the cap insert, the free edges of said wall means most remote from said sieve plate being in flush contact with the interior surface of said lid when the lid is mounted on the cap insert and thereby closes said castor.

4,120,433

HANGER FOR SUPPORTING PANTS AND THE LIKE

Alan F. Meckstroth, 2310 Far Hills Bldg., Dayton, Ohio 45419

Filed Aug. 31, 1977, Ser. No. 829,231

Int. Cl.[2] A47J *51/094*

U.S. Cl. 223—95 **13 Claims**

1. A hanger for supporting pants from a clothes rod, comprising a generally horizontal elongated first support member, a generally horizontal elongated second support member disposed above said first support member in generally parallel spaced relation, a third support member connected to said first support member and projecting above said second support member, means for releasably connecting said third support member to the clothes rod with said first and second support members depending from said third support member, said second support member being supported in a cantilever manner between said first and third support members and having a free end, means for guiding said free end and said second support member on one side of inverted vertical pants and said first and third support members on the other side of the pants when said hanger is inverted and slid laterally onto the pants and while maintaining said spaced relation between said first and second support members, and the vertical spacing between said first and second support members being sufficient to avoid clamping the pants therebetween when the inverted hanger is slid laterally onto the pants to facilitate convenient and quick attachment of the hanger to the pants.

4,120,434

BELT SUPPORTED CAMERA CADDY

Donald R. Hewes, Rte. 2, Box 224D, Newberg, Oreg. 97132

Filed Mar. 30, 1977, Ser. No. 783,081

Int. Cl.[2] A45F *5/02*

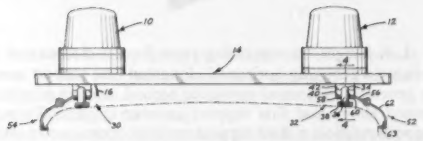
U.S. Cl. 224—5 V **7 Claims**

1. In combination with a camera of the type including a body defining front and rear sides, top and bottom sides extending between said front and rear sides and a lens barrel assembly projecting outwardly from the front side of said body, a camera caddy comprising an elongated strip of flexible and resilient material, opposite end portions of said strip having first and second barrel assembly receiving openings formed therethrough, said strip including a longitudinally extending central portion located between said openings and extending from one

of said opposite end portions to the other of said opposite end portions, said central portion having closed ended, transversely spaced longitudinal belt receiving slots formed therein for enabling said strip to be attached to a waist belt of the user, said strip being of a length to snugly encircle a portion of said

camera with the opposite end portions of said strip disposed in end overlapped relation with said lens barrel assembly removably projecting through said openings and said central portion overlying the bottom side of said camera when said camera caddy is supporting the camera from the user's belt with the belt threaded through said slots.

4,120,435
EMERGENCY LIGHT BAR
George W. Eby, Rt. 1, Box 278A, Colton, Oreg. 97017
Filed Aug. 27, 1976, Ser. No. 718,169
Int. Cl.[2] B60N *11/00*
U.S. Cl. 224—42.1 F 5 Claims



1. A bar and emergency warning unit assembly for vehicle mounting comprising

a single elongate continuous hollow bar adapted to span the width of the roof of the cab of the vehicle having an elongate upper web, opposed side flanges integral at upper margins with said web, and a pair of opposed inwardly projecting elongate shoulders joined to respective lower margins of said flanges forming the bottom of the bar, said shoulders having inner edges spaced from each other to define an elongate opening extending along the base of the bar,

an emergency warning unit mounted on the top of said bar,

a foot structure under the bar for supporting the bar on the roof of a vehicle, the foot structure including an elongate segment extending transversely of said bar equipped with roof engaging pads,

each of said shoulders along its upper side having a raised rib extending therealong with an elongate trough defined intermediate the rib and the flange to which the shoulder joins,

clamp means joining the foot structure to said bar, said clamp means including an upper clamp member engaging the upper sides of said shoulders and having a lower surface region complementing the rib and trough of each shoulder, and a lower clamp member engaging the undersides of said shoulders, said segment of the foot structure extending under said lower clamp member, said clamp means further including a block supporting the underside of said segment opposite said lower clamp member, the trough and raised ribs of said shoulders and the complementing lower surface region of the upper clamp member being effective to contribute to the rigidity of the bar by inhibiting twisting and flexing of the bar,

and hook mechanism adapted to engage a protuberance on a vehicle

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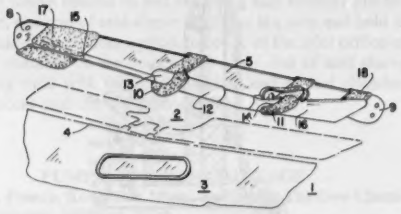
4,120,436
GUN RACK FOR A VEHICLE
Delwin L. Burch, Graham, Tex., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Oct. 25, 1977, Ser. No. 845,266
Int. Cl.[2] B62J *7/00*
U.S. Cl. 224—42.1 C 3 Claims



1. A gun rack for a vehicle having a cab, a roof covering the cab and a windshield at the front of the cab extending along the width of the roof from side to side thereof, the windshield having an upper edge substantially joining the roof and extending parallel thereto, said gun rack comprising

a plank-like member having spaced opposite substantially planar first and second surfaces and spaced opposite first and second ends;

a pair of C-type open hook members extending from the first surface of the member in spaced substantially parallel relation with each other at intermediate points between the first and second ends thereof, said hook members releasably supporting a rifle at points thereof between the barrel and stock;

a first band of soft material on the first surface of the member at the first end thereof;

a second band of soft material on the first surface of the member at the second end thereof; and

fastening means affixing the member to the roof in the cab substantially parallel to the upper edge of the windshield with the second surface of the member abutting said roof whereby said member releasably supports a rifle in the hook members thereof with the first and second bands preventing scratching of the stock and barrel.

4,120,437
CARRIER FOR SKIS AND SKI POLES
Clarence M. Hara, 2018 W. 150th St., Gardena, Calif. 90247
Filed May 9, 1977, Ser. No. 794,825
Int. Cl.[2] B65D *71/00*
U.S. Cl. 224—45 S 2 Claims

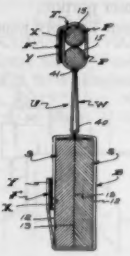
1. A carrier assembly for carrying a pair of skis and a pair of ski poles, comprising:

a pair of coupling straps, each of which is made wholly of flexible material and which includes top and bottom loops and an intermediate portion therebetween;

the bottom loop being of a size to encircle a pair of skis placed in side-by-side relationship, the top loop being of a size to encircle a pair of ski poles placed in side-by-side relationship, and the intermediate portion being of a length to provide a finger-clearing space between the top and bottom loops when in use;

one of said loops and the intermediate portion of each strap comprising a unitary strip of flexible material doubled back upon itself to provide the loop at one end of the intermediate portion, and the other loop comprising a unitary strip of flexible material fastened intermediate the

ends thereof to the end of said intermediate portion opposite from said one loop; and



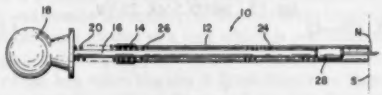
each of said loops being split and having overlapping end portions with pressure-engagable fastening means for adjustably and releasably securing said end portions together.

4,120,438

NAIL DRIVER

Ivan J. Litch, 21611 Locust Way, Lynnwood, Wash. 98036

Filed Mar. 7, 1977, Ser. No. 774,598
Int. Cl.[2] B25C *1/02*
U.S. Cl. 227—147 **1 Claim**



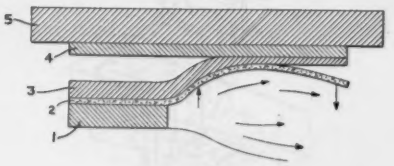
1. An apparatus for driving a nail into a surface comprising:
an open-ended tubular housing having an internal bore therein, a forward end which contacts over its entire surface the surface into which the nail is to be driven and a rear end,
an end cap having an aperture therein with a diameter smaller than the diameter of the internal bore of the housing and closing the rear end of the housing,
a rod having a diameter approximating the diameter of the aperture in the end cap and having a length greater than the length of the tubular housing received in the internal bore, the rod having a rear end projecting from the bore at the rear end of the housing through the aperture in the end cap and a forward end secured to a magnetic rod portion having a diameter approximating the diameter of the internal bore of the housing, the aperture in the end cap and the magnetic rod aligning the rod within the internal bore of the housing,
a weighted handle secured to the rear end of the rod,
a first compression spring surrounding the rod and extending between the weighted handle and the end cap to absorb the momentum of the weighted handle at the forward end of a driving stroke and to cushion the forward movement of the rod with respect to the housing, and
a second compression spring having a relatively low spring constant mounted within the tubular housing and extending between the magnetic rod portion and the end cap for resiliently biasing the rod in a forward direction but not providing the rod with sufficient momentum to drive a nail, the apparatus used by inserting a nail in the bore at the forward end of the housing with the head of the nail magnetically secured to the magnetic rod portion and driving the nail into the surface by placing the forward end of the housing against the surface and repetitively withdrawing the weighted handle and hurling the weighted handle toward the surface.

4,120,439

METHOD FOR WELDING BY EXPLOSION OF POWDER MATERIAL ON A FIRM SURFACE

Per Ingemar Persson, Nora, Sweden, assignor to Nitro Nobel AB, Gyttorp, Sweden

Filed Jun. 27, 1977, Ser. No. 810,086
Claims priority, application Sweden, Jul. 6, 1976, 7607713
Int. Cl.[2] B23K *21/00*
U.S. Cl. 228—107 **7 Claims**



1. A method of welding powdered material to a surface comprising placing at least one layer of powdered material onto a support of ductile material, positioning a surface to be coated by the powdered material in facing spaced relation with said powdered material, placing an explosive charge on the support on the surface thereof opposite the powdered material, and detonating the explosive charge to produce acceleration of the support and the powdered material thereon towards the surface to be coated to cause impact of the powdered material with the surface to be coated, the detonation of the explosive charge proceeding along the length of the charge to progressively bring the powdered material into impact contact with the surface to be coated, the speed of detonation of the explosive charge being less than the speed of sound in the powdered material or support.

4,120,440

WELDING, A STEEL SUITABLE FOR USE THEREIN

Philip R. Kirkwood, Middlesbrough, and Allan Clark, Newton Aycliffe, both of England, assignors to British Steel Corporation, London, England

Continuation of Ser. No. 638,518, Dec. 8, 1975, abandoned. This application May 11, 1977, Ser. No. 795,884
Claims priority, application United Kingdom, Dec. 12, 1974, 53806/74
The portion of the term of this patent subsequent to Jun. 14, 1994, has been disclaimed.
Int. Cl.[2] B23K *35/30*
U.S. Cl. 228—231 **10 Claims**

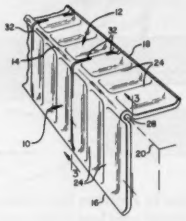
1. A consumable welding wire for submerged arc welding under a basic flux, said wire consisting essentially of steel consisting essentially of

Carbon 0.15 maximum
Manganese: 0.5–1.5
Silicon: 0.03–0.10
Molybdenum: less than 0.2
Aluminium: 0.05 maximum
Titanium: 0.03–0.05
Boron 0.002–0.008
Sulphur: 0.04 maximum
Phosphorus: 0.04 maximum
Iron and incidental impurities: Balance.

4,120,441
ANGLE EDGE GUARD

Richard D. Hurley, 3210 NW. McKinley Dr., Corvallis, Oreg. 97330

Continuation of Ser. No. 656,571, Feb. 9, 1976, abandoned. This application Apr. 25, 1977, Ser. No. 791,128
Int. Cl.[2] B65D *5/00*
U.S. Cl. 206—586 4 Claims



1. A unitary angle edge guard protector adapted for interposition between a substantially ninety degree interior corner of a shipping container and the exterior angle edge of an object being shipped, comprising:

(a) a pair of generally flat molded pulp walls;

(b) said walls being integrally joined by an arcuate portion and being in substantially ninety degree relation to one another when in place between said interior corner of a shipping container and a said exterior angle edge of an object being shipped;

(c) each of said walls having an outwardly facing surface;

(d) each of said walls having outwardly facing elongate leading edges;

(e) each of said outwardly facing surface of said walls having a plurality of outwardly facing indentations at spaced intervals from a predetermined distance from said leading edge and a predetermined distance from said arcuate portion and normal to said leading edges;

(f) said arcuate portion defining an inwardly facing elongate groove between said inwardly facing surface of said walls;

(g) each of said inwardly facing surface of said walls having a plurality of inwardly facing indentations normal to said leading edges at spaced interals from a predetermined distance from said leading edge to said arcuate portion and integral with said elongate groove;

(h) said inwardly facing indentations being joined by relatively flat planar surfaces and said planar surfaces being oppositely disposed to said outwardly facing indentations;

(i) said outwardly facing indentations being joined by substantially rounded web surfaces and said rounded web surfaces being oppositely disposed to said inwardly facing indentations;

(j) said walls including an angle of less than ninety degrees in a free, non-stressed condition, said walls being relatively movable around said elongate groove from the non-stressed condition to the ninety degree condition.

4,120,442
PARTITION ARRANGEMENT

Boyd T. Skaggs, Louisville, Ky., assignor to Container Corporation of America, Chicago, Ill.

Filed Feb. 10, 1978, Ser. No. 876,521
Int. Cl.[2] B65D *5/48, 25/04*
U.S. Cl. 229—15 7 Claims

1. A one-piece, six-cell partition, formed from a unitary blank of foldable paperboard, comprising:

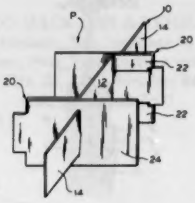
(a) a flat, vertically disposed, longitudinal member having a center portion and a pair of integral end portions;

(b) a pair of vertically disposed transverse members spaced from each other a distance equal to the length of the longitudinal member center portion;

(c) each of said transverse members including:

(i) an inner element foldably joined at an inner vertical edge to an adjacent vertical end edge of said longitudinal member center portion;

(ii) an outer element foldably joined at an outer vertical



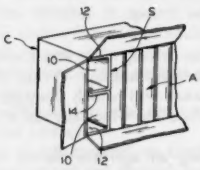
edge to a corresponding outer vertical edge of said inner member and disposed thereagainst in parallel relation therewith;

(d) each of said longitudinal member end sections extending beyond a related transverse member and through an opening in the outer element thereof.

4,120,443
CUSHIONING INSERT

Jeffrey M. Gardner, Wheaton, and Robert E. Beck, Chicago, both of Ill., assignors to Container Corporation of America, Chicago, Ill.

Filed Feb. 6, 1978, Ser. No. 875,451
Int. Cl.[2] B65D *5/48, 25/04*
U.S. Cl. 229—42 1 Claim



1. A cushioning insert, formed of a unitary blank of foldable paperboard, for providing an air cell to protect articles packaged within an outer container having bottom, side and end walls, comprising:

(a) a pair of co-planar, main panels aligned with each other in side by side relation, and adapted to be positioned within an outer container in spaced parallel relation with an end wall thereof;

(b) a pair of relatively narrow side panels foldably joined at their inboard side edges to adjacent outer side edges of respective main panels and adapted to be positioned within an outer container adjacent respective side walls thereof between said insert main panels and a related end wall of an outer container;

(c) a pair of relatively narrow center panels foldably joined at their outboard edges to each other and at their inboard side edges to adjacent inner side edges of respective main panels;

(d) an integral support member for maintaining said center panels in parallel relation with said side panels and in normal relation with said main panels, comprising:

(i) a pair of generally triangular, vertical, flange elements foldably joined at lower side edges to lower edges of respective main panels along downwardly diverging fold lines;

(ii) a pair of generally rectangular, horizontal flange elements foldably joined at inboard side edges to upper edges of respective vertical flange elements and fold-

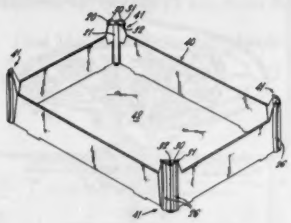
ably joined at other adjacent side edges to lower edges of respective center panels.

4,120,444

SECURING DEVICES

Lionel Cedric Nall Gray, Great Woodland Farm, Lyminge, Folkestone, Kent, CT18 8DW, England

Filed Mar. 30, 1977, Ser. No. 782,964
Int. Cl.[2] B65D *5/44;* A44B *21/00;* B65D *21/02*
U.S. Cl. 229—49 18 Claims



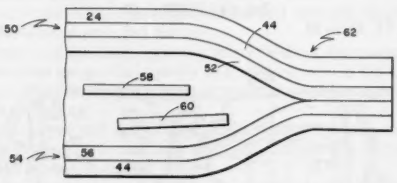
1. A clip capable of fitment over a corner of the marginal wall of a box, comprising a bifurcated member of a resilient, but self supporting material, of which a first furcation is adapted to fit inside and along the corner of the box, and of which a second furcation is longer than the first furcation to which it is joined by a head portion and is adapted to extend along and outside the corner, the free end of the longer, second furcation being formed as a foot which is positioned so as to engage and thereby support the underside of the corner of the base of the box when the clip is fitted thereover, there being means permitting resilient flexure of the first furcation with respect to the second furcation in a direction away from the second furcation such that the flexing of said first furcation away from the second furcation permits the fitment of the clip over said corner, and the cessation of said flexure once the clip is fitted over said corner permits the first furcation to urge the corner towards engagement with said foot and said second furcation.

4,120,445

INFORMATION-BEARING ARTICLE FOR CONVEYING INFORMATION WHICH CANNOT BE SURREPTITIOUSLY DETECTED

Lee A. Carrier, Longmeadow, and Leon G. Carpenter, Wilbraham, both of Mass., assignors to Ludlow Corporation, Needham Heights, Mass.

Filed May 12, 1976, Ser. No. 685,646
Int. Cl.[2] B65D *33/34*
U.S. Cl. 229—53 16 Claims



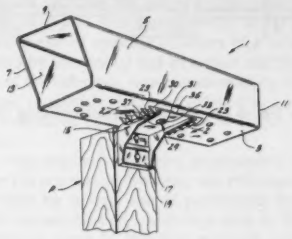
1. A pouch formed of a sheet material comprising a polymer-based cohesive seal and said pouch comprising a polymer-based coating formed of small thermoplastic polymeric particles deposited in intimate contact with another within said pouch-forming sheet material, and wherein the appearance of said based coating is irreversibly and substantially changed by subjecting said polymeric particles to temperatures of at least 140° F.

4,120,446

NEWSPAPER DELIVERY RECEPTACLE

Vincent F. Fuemmeler, 514 Teal Lake Rd., Mexico, Mo. 65265

Continuation of Ser. No. 618,009, Sep. 30, 1975, abandoned. This application Feb. 28, 1977, Ser. No. 772,666
Int. Cl.[2] B65D *91/00*
U.S. Cl. 232—17 9 Claims



1. A newspaper delivery receptacle having a bottom, sides and top, closed at one end constituting its back end and open at its front end for insertion of a newspaper therein, and means for mounting said receptacle in generally horizontal position on a post comprising a bracket having a vertical leg adapted to be fastened to the post and a horizontal leg extending laterally outwardly from the vertical leg, and means on the outside of the bottom of the receptacle for slidably receiving said horizontal leg of the bracket, said bottom having an integral portion extending between said receiving means and integrally joined to said bottom on all sides thereof including the sides at said receiving means, said horizontal leg having an integral portion extending from side to side of the horizontal leg, one of said portions having a boss and the other having an opening for receiving said boss, and at least one of said portions being adapted to flex between the sides thereof for snap-fastening the receptacle to said horizontal leg upon sliding the receptacle into interengagement with said horizontal leg, said means for slidably receiving said horizontal leg comprising a channel defined by a pair of shoulders extending transversely across the outside of the bottom of the receptacle having grooves for slidably receiving the side margins of said horizontal leg of the bracket, and said receptacle being adapted to be applied to the bracket by sliding the receptacle onto the horizontal leg of the bracket from the outer end thereof, with said channel being open at each of its ends allowing the receptacle to be slid onto the horizontal leg with the front end of the receptacle toward either side of that leg.

4,120,447

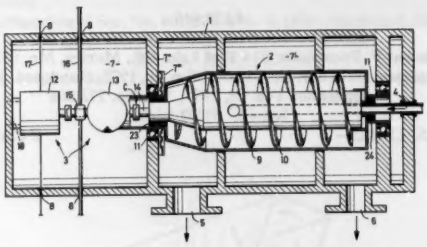
PRESSURE-TIGHT SOLID BOWL SCREW CENTRIFUGE

Ernst Adolf Jäger, Vilsbiburg, Germany, assignor to Flottweg-Werk Dr. Georg Bruckmayer GmbH & Co. KG, Germany

Filed Oct. 26, 1976, Ser. No. 735,903
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1975, 2547538
Int. Cl.[2] B04B *3/04, 9/06*
U.S. Cl. 233—7 11 Claims

1. A centrifuge arrangement comprising:
a centrifuge bowl,
a screw rotatably arranged in the centrifuge bowl,
drive motor means for driving said centrifuge bowl and said screw,
a housing means for completely enclosing said centrifuge bowl and said drive motor means in a pressure-tight manner, and

means provided at said housing means for enabling a creation of a higher pressure in an area surrounding the drive



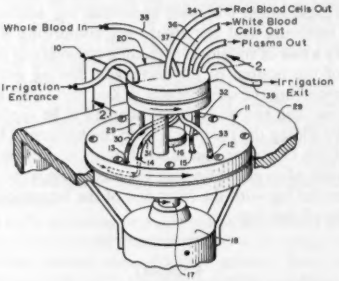
motor means than in an area surrounding the centrifuge bowl.

4,120,448

CENTRIFUGAL LIQUID PROCESSING APPARATUS WITH AUTOMATICALLY POSITIONED COLLECTION PORT

Herbert M. Cullis, Silver Spring, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jun. 8, 1977, Ser. No. 804,697
Int. Cl.[2] B04B *11/06*
U.S. Cl. 233—22 **12 Claims**



1. A centrifugal processor for use in conjunction with centrifugation apparatus including rotatable drive means for separating a selected fractional component from a whole fluid, said separator comprising, in combination:

a housing carried on said rotatable drive means and defining a centrifugal processing separation chamber;

inlet means including an inlet port for supplying the whole fluid to be processed to said separation chamber, said selected fraction congregating within said chamber in a collection zone upon centrifugation of said chamber; and

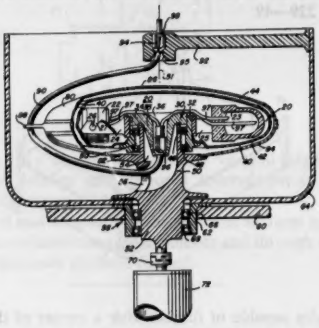
collection means including a free-floating collection port disposed within said chamber and floating within said separation zone during rotation of said chamber for removing said selected fraction therefrom.

4,120,449

CENTRIFUGAL PROCESSING APPARATUS USING TUBE DRIVE

Richard I. Brown, Northbrook, and Daniel R. Boggs, Vernon Hills, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jun. 13, 1977, Ser. No. 805,952
Int. Cl.[2] B04B *9/00*
U.S. Cl. 233—23 R **7 Claims**



1. Centrifugal processing apparatus, which comprises:

a stationary base;

a processing chamber rotatably mounted with respect to said base for rotation about a predetermined axis;

an umbilical cable segment formed of tubular material having a dynamic stiffness of between 0.1 in. [2] pounds and 100 in. [2] pounds for establishing fluid communication with said processing chamber, one end of said cable segment being fixed with respect to said base substantially along said axis at one side of said processing chamber, the other end of said cable segment being attached substantially on said axis in rotationally locked engagement to said processing chamber;

means for engaging and driving said cable segment;

means rotatably coupling said engaging and driving means to said processing chamber;

means for rotating said engaging and driving means to drive said cable segment at a selected speed; and

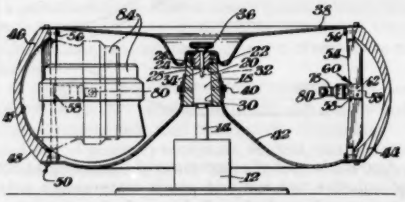
said processing chamber forming an idling member which follows only the driving rotation of said cable segment to rotate at twice the speed of said cable segment without the need for any external drive.

4,120,450

HIGH-CAPACITY CENTRIFUGE ROTOR

Thomas Wilson Whitehead, Newtown, Conn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 6, 1977, Ser. No. 794,673
Int. Cl.[2] B04B *5/02*
U.S. Cl. 233—26 **15 Claims**



1. In a swinging-bucket centrifuge rotor having a hub, an outer ring having upper, mid, and lower portions, radial means interconnecting said hub and said ring for rotation about a

generally vertical axis, and pivotal means for pivotally supporting said buckets to swing upwardly and outwardly in use to contact and be supported against radial movement by said ring, the improvement wherein:

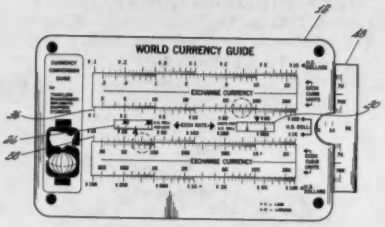
said ring has a radial cross section having a radial thickness that is less at said mid portion than at said upper and lower portions.

4,120,451

CURRENCY CONVERTER FOR USE WITH PRE-ESTABLISHED AND KNOWN CONVERSION DATA

Gerald F. Stapleton, 967 St. Mary's La., Santa Barbara, Calif. 93111

Filed May 7, 1976, Ser. No. 684,085
Int. Cl.[2] G06G *1/02*
U.S. Cl. 235—89 R **11 Claims**



1. A converter adapted to be programmed for use by pre-established conversion data and known conversion data comprising

a fixed frame having means defining

a hollowed-out central area extending axially therethrough,

a first opening extending lengthwise across the frame and having extending lengthwise in parallel thereto at least one reference line of indicia designating a selected range of a quantity of a reference item in the form of a logarithmic scale;

a second opening positioned in spaced relationship with said first opening and having a first reference mark designating a unit of a reference item to be converted into a quantity number of a selected item; and

a third opening positioned in a spaced relationship with said first opening and said second opening and having a second reference mark designating the reciprocal of the conversion displayed in said second opening at said first reference mark;

means defining a first aperture and a program reference mark positioned at a predetermined location adjacent the aperture, and

means defining a second aperture having a reading reference mark positioned at a predetermined location adjacent the second aperture;

a removable slider positioned within and movable through said central area and having

at least one exchange quantity line of indicia designating a selected range of a quantity of a selected item in the form of a logarithmic scale adapted to be viewed through said first opening;

a separate second line of indicia designating quantity numbers of said selected item adapted to be viewed through said second opening;

a separate third line of indicia designating quantity numbers of said reference item adapted to be viewed through said third opening;

a first pre-established conversion data bearing area having in a predetermined position names identifying groups of units of a corresponding selected item to be converted between the reference indicia and the selected indicia, each of said identifying name being adapted to be selectively viewed through said first aperture when set adjacent said program reference mark; and

a second pre-established conversion data bearing area having in a predetermined position the name of a unit of the selected item corresponding to the identifying name contained in said first pre-established conversion data information bearing area, said name of the unit of a selected item being adapted to be viewed through the second aperture adjacent the reading reference mark in response to the identifying name being positioned adjacent said program reference mark;

said lines of indicia having a pre-established relationship therebetween wherein the range of the quantity of the selected item of said exchange quantity line is fixed relative to the range of quantity numbers of a selected item represented by the second line of indicia and the quantity numbers of the reference item represented by the third of indicia, said relationship being established by the predetermined locations of each of said line of indicia affixed to said slider;

said slider being responsive to being programmed relative to the frame for conversion between the reference item and selected item by at least one of positioning the slider to locate the pre-established conversion data in the form of an identifying name in the first aperture adjacent the programmed reference mark, positioning the slider to locate the pre-established conversion data in the form of a name of a unit of a selected item in the second aperture adjacent the reading reference mark, positioning the slider to locate a known quantity of units of a reference item for a unit of a selected item adjacent the first reference mark in the second opening, and positioning the slider to locate a known quantity of units of a reference item for a unit of selected item adjacent the first reference mark in the third opening;

said slider when so programmed simultaneously displaying the conversion between the quantity of a selected item per unit of a reference item and the reciprocal thereof adjacent the reference mark in said second and third opening respectively and setting the at least one exchange quantity of indicia relative to said first opening wherein the conversion between quantity of units of a reference item and quantity of units of a selected item can be read directly between each of the logarithmic scales.

4,120,452

AUTOMATIC VENDING SYSTEM

Atsushi Kimura, Ikeda, and Tasuku Ishimoto, Toyonaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Aug. 12, 1976, Ser. No. 713,643
Claims priority, application Japan, Aug. 14, 1975, 50-99220; Sep. 25, 1975, 50-116193; Sep. 25, 1975, 50-116194; Sep. 26, 1975, 50-116991; Feb. 10, 1976, 51-13430
Int. Cl.[2] G07F *7/08*; G06K *19/06*
U.S. Cl. 235—381 **5 Claims**

1. An automatic vending system for use in a hotel or the like, comprising:

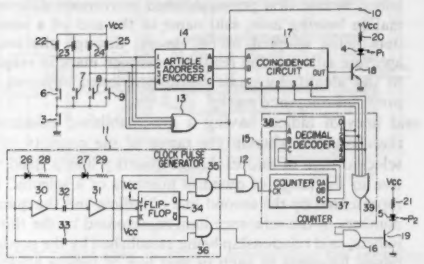
a plurality of vending machines each of which stores a plurality of articles to be sold and is enabled to sell an article by selection means, each of said machines including a transmitter capable of generating a serial article code representative of an article selected by said selection means and clock means;

a portable individual identification means for sequentially serially holding the article codes generated in response to the operation of said selection means for selecting a desired article after said identification means has been inserted into the vending machine;

an accounting meachine for reading the article codes from said identification means so as to calculate the sum of the prices of the articles sold for liquidation by a holder of said identification means;

the transmission of the signals between the vending machine and the identification means being made by wireless coupling means;

a selected article being sold in response to a sale signal, and



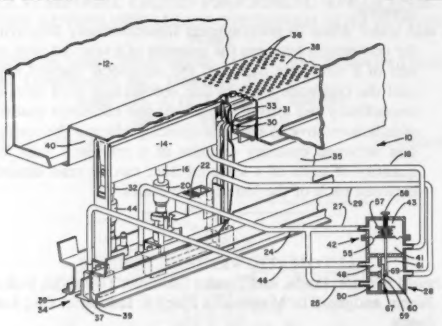
means for generating said sale signal only when the article code recorded in the identification means coincides with the article code generated by said transmitter after the article code generated by said selection means has been stored in said identification means.

4,120,453

AIR DISTRIBUTION UNIT

Carl C. Herb, Camillus, and Robert A. Rose, Liverpool, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 29, 1977, Ser. No. 792,388
Int. Cl.[2] F24F *11/04*
U.S. Cl. 236—49 **3 Claims**



1. In an air distribution unit for discharging conditioned air into an area to be conditioned, means defining a plenum chamber for receiving conditioned air, means defining an outlet from said plenum chamber into the area to be conditioned, a damper arrangement including an inflatable bellows to regulate the flow of conditioned air from said plenum chamber to said outlet means, and control means including thermostatic means to vary the inflation of said bellows in accordance with the temperature of the area being conditioned whereby inflation of the bellows is increased to decrease the quantity of air discharged into the area and is decreased to increase the quantity of conditioned air discharged into the area, wherein the improvement comprises:

said control means including override means operable to decrease the pressure in said bellows to reduce the inflation thereof to a predetermined maximum to maintain a minimum flow of conditioned air from said plenum chamber to said outlet means when said inflatable bellows, in response to said thermostatic means, has substantially terminated the flow of air from said plenum chamber to said outlet means, said override means including pressure responsive means operable to transmit a predetermined magnitude control signal to inflate said bellows to a predetermined level; and

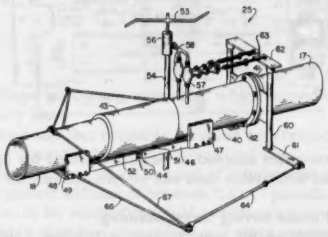
a three-way valve having a first operating position whereat a pressure signal indicative of sensed area temperature is transmitted to said bellows and a second operating position whereat said predetermined magnitude control signal is transmitted to said bellows.

4,120,454

CENTER PIVOT IRRIGATION APPARATUS

Larry D. Holtzen, 1311 3rd St., Deshler, Nebr. 68340

Filed Mar. 24, 1977, Ser. No. 780,941
Int. Cl.[2] B05B *3/02*
U.S. Cl. 239—177 **8 Claims**



1. A self-propelled sprinkling and irrigating apparatus for connection to a pivotable source of pressurized water, said apparatus comprising:

(a) a first elongate conduit having a first end and a second end, said first end of said first elongate conduit adapted to be connected in fluid flow communication with the pivotable source of pressurized water;

(b) a first sprinkler section including:

a first tower conduit having a first end and a second end, said first end of said tower conduit flexibly and sealingly connected to the second end of said first elongate conduit and in fluid flow communication therewith;

first and second valves each having an input and an output port, said input ports connected to and in fluid flow communication with said first tower conduit, said output ports connected to and in fluid flow communication with a common manifold;

valve control means connected to said first and second valves, said first elongate conduit and said first tower conduit for selectively opening and closing said first and second valves in response to the alignment of said first elongate conduit and said first tower conduit;

(c) a first support tower rigidly connected to said first tower conduit, said first support tower having a pair of wheels thereon adapted to contact the ground;

(d) a first transmission having at least forward and reverse gearing affixed to said first support tower and drivingly connected to said pair of wheels;

(e) a first sprinkler head connected to and in fluid flow communication with said manifold;

(f) a first drive shaft connected between said first sprinkler head and said first transmission; and

(g) first electrical control means connected to said first transmission to control the gearing of said first transmission.

4,120,455

APPARATUS FOR COOLING METAL SECTIONS

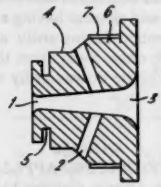
Stephan Hubert Wilmotte, Chaudfontaine; Jean Adolphe Nautet, Hony, and Marios Economopoulos, Liege, all of Belgium, assignors to Centre de Recherches Metallurgiques-Centrum Voor Research In de Metallurgie, Brussels, Belgium

Filed Jan. 19, 1977, Ser. No. 760,579

Claims priority, application Belgium, Jan. 23, 1976, 837884; Aug. 6, 1976, 845004

Int. Cl.[2] B22D *11/124*

U.S. Cl. 239—429 7 Claims



1. Cooling apparatus for cooling metal sections, comprising: (a) a series of sprayers for simultaneously spraying a mixture of liquid and gas, each sprayer having a gas inlet at one end, a mixture outlet at the other end, two distinct peripheral shoulders and at least one liquid inlet between the two shoulders; (b) an elongate manifold for supplying the sprayers with gas, having outlet orifices adapted to seat the gas-inlet-side shoulders of the respective sprayers in a gas-tight manner; and (c) an elongate manifold for supplying the sprayers with liquid, having outlet orifices adapted to seat the mixture-outlet-side shoulders of the respective sprayers in a liquid-tight manner.

4,120,456

FUEL INJECTION VALVE WITH VORTEX CHAMBER OCCUPYING AUXILIARY VALVE

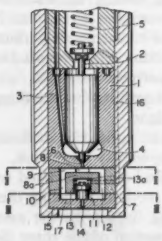
Takeo Kimura, and Hitoshi Tomita, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Dec. 3, 1976, Ser. No. 747,147

Claims priority, application Japan, Jan. 28, 1976, 51-8434[U]

Int. Cl.[2] B05B *1/30, 1/34*

U.S. Cl. 239—464 2 Claims



1. In a fuel injection valve for an internal combustion engine including a valve body having a central bore therein, a circular main valve seat within the valve body, a fuel reservoir within the valve body adjacent to and surrounding the main valve seat, and an inwardly opening needle valve slidably disposed in said bore and having a tip portion adapted to enter and engage the main valve seat to isolate the fuel reservoir therefrom, the improvements characterized by:

(a) a fuel injection opening in the lower end of the valve body defining an auxiliary valve seat at its upper end,

(b) a vortex chamber defined in the valve body just above the fuel injection opening,

(c) fuel delivery passages having inlet ends communicating with the circular main valve seat to receive fuel flowing past said needle valve when open, and outlet ends tangentially communicating with the vortex chamber, and

(d) an auxiliary valve disposed above the vortex chamber for entering and occupying said chamber in response to a reduction in pressure in said vortex chamber at the completion of each injection cycle and for engaging the auxiliary valve seat to close the fuel injection opening, thereby expelling substantially all residual fuel from the vortex chamber in preparation for the next injection cycle.

4,120,457

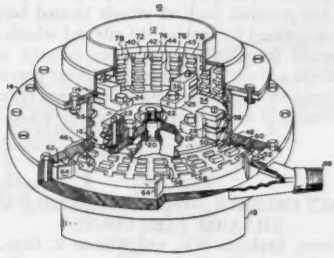
PULVERIZER

Donald F. Link, Huntsville, Ala., assignor to Recovery Systems, Inc., Charleston, S.C.

Continuation-in-part of Ser. No. 766,132, Feb. 7, 1977, Pat. No. 4,074,868. This application Oct. 25, 1977, Ser. No. 845,362

Int. Cl.[2] B02C *13/16*

U.S. Cl. 241—46 R 4 Claims



1. A pulverizer comprising:

a stator member comprising:

a vertically oriented, generally round, cylindrical, interior surface, the top end of which forms an input opening to said pulverizer, and said surface having a plurality of vertical and circumferentially horizontal spaced rows and columns of lands and grooves, and wherein grooves lying in one column vary in depth with respect to grooves lying in horizontally adjacent grooves;

a first circular plate extending around and radially outward from a lower end of said interior surface, and having a lower, generally horizontal, surface comprising a plurality of concentrically and circumferentially spaced lands;

a motor;

a rotor member driven from said motor comprising:

a second circular plate positioned for rotation about a vertical axis concentric with said cylindrical surface of said stator member, and

at least one hammer rotably attached to said second circular plate for horizontal pivotal movement about a vertical axis, said hammer being positioned to pass within a groove with lands of said cylindrical surface of said stator member, and

a plurality of concentrically and circumferentially spaced lands and grooves in said second circular plate and positioned for mating rotation between said lands of said first circular plate of said stator member; and

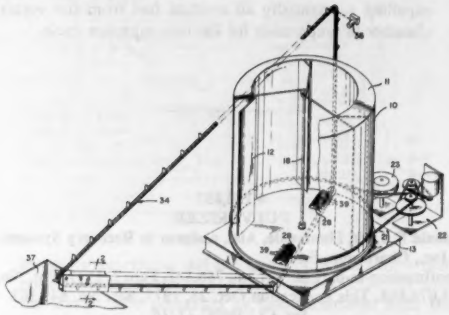
collection means including an annular passageway generally outboard of said circular plates for collecting pulverized material passing outboard and between said circular plates and for providing said material as a confined output flow.

4,120,458

ROTARY WOOD WASTE GRINDER

John H. Hughes, Montesano, Wash., assignor to J. H. Hughes, Inc., Montesano, Wash.

Filed Jun. 17, 1977, Ser. No. 807,424
Int. Cl.[2] B02C *13/286*
U.S. Cl. 241—186 R **8 Claims**



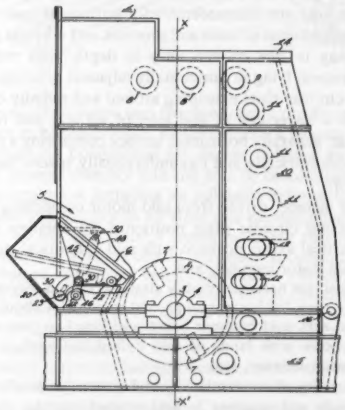
7. A wood waste grinder comprising storage means for holding a pile of wood waste material, a plurality of freely rotatable, non-powered, toothed wheels located below said storage means, means for moving the pile and wheels relative to one another for engaging the waste material with the toothed wheels, and with the relative movement providing the rotational force to rotate the wheels, and means for carrying material away from the storage means.

4,120,459

IMPACT CRUSHER WITH RETRACTABLE AND TILTABLE FEED CHUTE

Keith B. Lowe, Appleton, Wis., and William R. Gray, Joplin, Mo., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation of Ser. No. 433,841, Jan. 16, 1974, abandoned. This application Mar. 3, 1975, Ser. No. 554,917
Int. Cl.[2] B02C *13/04, 13/286*
U.S. Cl. 241—186.2 **5 Claims**



1. A crusher having a housing enclosing a rotor carrying hammers arranged to strike and throw input material to disintegrate upon impact with target members spaced from the rotor, and an improved input material feed assembly on a side of a vertical plane through the axis of the rotor, opposite at least some of the target members; and said feed assembly comprising:

(a) a pair of horizontally spaced vertical parallel side walls perpendicular to the rotor axis;

(b) a feed chute extending transversely between said side walls;

(c) camming means supporting said chute relative to the side walls with the chute inclined downwardly toward the rotor and having a material discharge lip in close proximity to the rotor; and

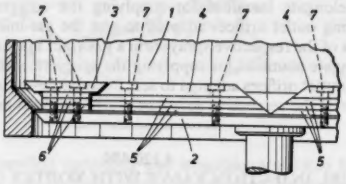
(d) said camming means including an element carried by the side walls to turn an engaging member connected to the chute about a fixed horizontal axis beneath the upper end of the chute, and said element having a portion for moving the engaged member downwardly and away from the rotor to move the chute away from the rotor and tilt the upper end of the chute downwardly toward a horizontal position.

4,120,460

DISINTEGRATING APPLIANCE

Helmuth Bacher, Linz, Austria, assignor to Krauss-Maffei Austria Gesellschaft m.b.H., Aster Nr. 211, Austria

Filed Jun. 3, 1977, Ser. No. 803,228
Claims priority, application Austria, Jun. 8, 1976, 4168/76
Int. Cl.[2] B02C *18/12, 18/18*
U.S. Cl. 241—278 R **2 Claims**



1. An appliance for disintegrating synthetic thermoplastic waste material, comprising

(a) an upright container having an open top for receiving the waste material and an open bottom,

(b) a rotor disc mounted in the open bottom of the container for rotation in a horizontal plane about a vertical axis,

(1) the container having an inside surface defining the open bottom and the rotor disc having a periphery extending close to the inside surface,

(c) a plurality of cutting teeth mounted on the rotor disc and disposed at the periphery thereof,

(1) each cutting tooth having a cutting edge extending in a horizontal plane,

(d) a like plurality of radial ribs mounted on the rotor disc and projecting upwardly therefrom,

(1) each of the ribs being associated with a respective one of the cutting teeth and leading thereto, and

(2) the ribs being flush with the associated teeth in the direction of rotation of the rotor disc, and

(e) shim means mounted detachably between the rotor disc and each of the ribs and of the cutting teeth for adjusting the height of the ribs and teeth.

4,120,461

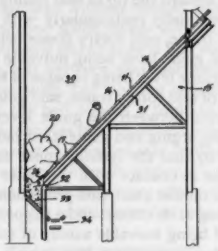
LUMP BREAKING DEVICE

Heine Ahlgreen Sorensen, R.R. #3, Ayers Cliff, Quebec, Canada (J0B 1C0)

Filed Apr. 11, 1977, Ser. No. 786,582
Int. Cl.[2] B02C *1/00*
U.S. Cl. 241—283 **1 Claim**

1. A lump breaking device for breaking lumps formed in particulate material, said device comprising displaceable support means, a plurality of saw-tooth elements supported by a

portion of said support means, each said saw-tooth elements having opposed lump-breaking edges extending on at least one side of said support means and disposed in a plane extending parallel to one another and parallel to a reciprocating axis, reciprocating drive means secured to said support means for reciprocating same along said reciprocating axis whereby said lump-breaking edges will reciprocate and break up lumps of particulate material positioned thereover, said displaceable support means comprising a plurality of parallel spaced elongated support members extending parallel to said reciprocating axis, said lump-breaking edges being opposed cutting edges, said opposed cutting edges extending angularly from an apex of each said saw-tooth elements, said reciprocating drive



means being at least one piston secured adjacent a free end of one or more of said support members, a plurality of bridge bars secured between pairs of said support members remote from said free end, said saw-tooth elements being secured to said bridge bars, said bridge bars being disposed parallel to one another and secured at opposite ends between respective pairs of said support members, and guide bearings for maintaining said support members in parallel relationship and in a respective longitudinal axis, adjacent pairs of said pairs of support members being reciprocated in alternating sequence, and said support members being pointed at their ends opposed to said free ends to penetrate and break up lumps of particulate material.

4,120,462

METHOD AND DEVICE FOR CONTROLLING AND/OR REGULATING THREAD TENSION DURING WINDING OF A TEXTILE COIL

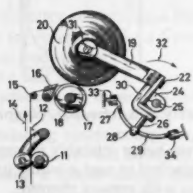
Hans Raasch, and Hans Ludwig Neuhaus, both of Monchen-Gladbach, Germany, assignors to W. Schlafhorst & Co., Monchen-Gladbach, Germany

Filed Mar. 29, 1976, Ser. No. 671,113

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1975, 2513981

Int. Cl.[2] **B65H** *59/38, 54/42, 54/52*

U.S. Cl. 242—45 **14 Claims**



1. Method of controlling or regulating tension in a thread being wound on a textile coil rolling on a winding roller of a thread winding device, at least one of the winding roller and the textile coil being of conical construction, which comprises tipping one of the winding roller and the textile coil relative to the other so as to increase the compressive force of the textile coil on the winding roller toward one of the two ends of the line of contact therebetween whereby the peripheral speed of the textile coil is varied by varying the transmission ratio between the rotary speed of the winding roller and the rotary speed of the textile coil to an extent greater than the variation in the transmission ratio therebetween resulting from the increasing fullness of the winding on the coil.

4,120,463

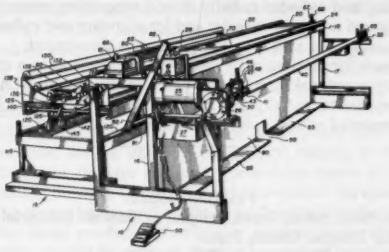
FLOOR COVERING MEASURING AND CUTTING APPARATUS

Gilbert L. Alinder, Sun City, Ariz., and Lloyd E. Anderson, Brooklyn Park, Minn., assignors to National Carpet Jobbers, Minneapolis, Minn.

Filed Aug. 31, 1977, Ser. No. 829,286

Int. Cl.[2] **B65H** *19/20*

U.S. Cl. 242—56 R **13 Claims**

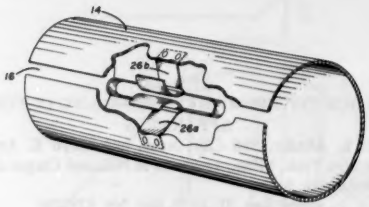


1. A floor covering measuring and cutting apparatus comprising: a stand having end supports with legs thereon and a flat table top extending between said supports, roller means distributed along the one edge of each side of said flat table top; drive motor means and control means therefor mounted on one of said end supports adjacent one end of said flat table top; a drive mandrel coupled to said drive motor means; a journaled mandrel mounted on the other of said end supports and aligned with said drive mandrel; a shaft removably mounted in said mandrels and extending therebetween for rotation by said drive mandrel; said shaft being positioned to one side of and below the flat table top and adapted to have floor covering material rolled thereon with operation of said drive motor means; a guide plate pivotally mounted beneath said table top on said end supports and adapted to be pivoted to be positioned below said shaft; lever means attached to said guide plate for pivoting the same; guide means positioned across said table top adjacent said one end thereof; measuring means positioned on said table top adjacent said drive means for measuring floor covering moved through said measuring means and across said table top; a cutter guide positioned on the table top adjacent the edge of said table top and adjacent said drive and driven mandrels; and an adjustable bed positioned longitudinally adjacent the extent of said stand and having a concave surface for supporting and rolling a roll of carpet material from which a piece of floor covering is to be measured and cut; said bed being adjustable longitudinally to bring an edge of the carpet material into alignment with the guide means on said table top as said roll of carpet material is unrolled.

4,120,464
TAKE-UP ROLL MECHANISM

Joseph M. Uritis, Chagrin Falls, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

Filed Dec. 2, 1977, Ser. No. 856,833
Int. Cl.[2] B65H 75/24
U.S. Cl. 242—72 R 7 Claims

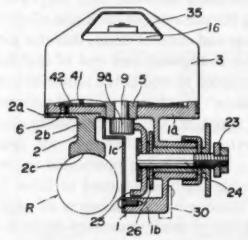


1. Improved apparatus for winding a strip of thin material, comprising:
a cylinder of thin-walled resilient material;
longitudinally extending slit through the wall of said cylinder;
means for supporting said cylinder for rotation about its axis;
means cooperating with said supporting means for expanding said cylinder radially as said supporting means is engaged with said cylinder and for allowing said cylinder to contract as said supporting means is disengaged;
means cooperating with said cylinder for gripping a strip of thin material inserted through said slit as said cylinder is expanded radially and for releasing such a strip of thin material as said cylinder is allowed to contract.

4,120,465
FISHING REEL

Hideo Noda, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Aug. 4, 1977, Ser. No. 821,815
Claims priority, application Japan, Aug. 13, 1976, 51/108907[U]
Int. Cl.[2] A01K 89/01, 89/02
U.S. Cl. 242—84.2 A 4 Claims

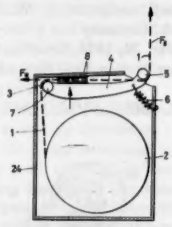


1. A fishing reel mounted to a fishing rod for winding a fishing line on a spool by operating a handle bar, said reel comprising:
a reel body;
a mounting leg for mounting said reel body to the fising rod;
a spool fixed to said reel body;
a rotary frame having a guide lever guiding the fishing line onto said spool;
a rotary shaft supporting therewith said rotary frame; and
a handle shaft having a handle bar which is operated to rotate said rotary shaft therewith;
said reel body having a tubular shaft which is fixed thereto and has the axis extending to intersect rectangularly with the axis of said handle shaft, said tubular shaft supporting therewith said rotary shaft in relation of being rotatable and axially movable, said tubular shaft being provided at the outer periphery of the utmost end thereof with a cam portion, said rotary shaft being protruded from the utmost end of said tubular shaft so as to fix said rotary frame at the protrudent portion of said rotary shaft, said mounting leg being mounted to said reel body, said mounting leg having a mounting seat face of a given length in the longitudinal direction of said fishing rod, said mounting seat face being lengthwise extending to be substantially rectangular with respect to the axis of said rotary shaft so that the reel body may be mounted to the fishing rod through said mounting leg in such a manner that the axis of rotation of said rotary frame extends substantially rectangularly with respect to the longitudinal direction of said fishing rod so that the fishing line may be drawn out toward the tip of said fishing rod in relation of being bent substantially rectangularly with respect to the axis of said rotary frame, said rotary frame being formed in a cup-like shape, said guide lever being movable radially of said rotary frame, said guide lever being capable of being protruded from the side wall of said rotary frame, said guide lever having a coil spring inserted between the guide lever and said side wall, said coil spring urging said guide lever radially inward of said rotary frame so that the radially inner end face of said guide lever may be in contact with the outer periphery and cam portion of said tubular shaft, said protrudent portion of the rotary shaft carrying at its utmost end a support and a control plate in relation of being movable axially of said rotary shaft, said support having supporting legs which are extending toward a stationary member fixed to said reel body, said supporting legs being brought into contact with said stationary member when said support is axially moved, thereby to prevent said support from further moving toward said stationary member, said control plate being adapted to be pressed toward said rotary frame for keeping said support stationary thereby to allow said rotary shaft to be axially movable by use of said support.

4,120,466
SAFETY BELT CLAMPING DEVICE

Heinz Dieter Adomeit, Knesebeckstr. 6/7, Berlin, Germany

Continuation of Ser. No. 593,710, Jul. 7, 1975, abandoned. This application Apr. 21, 1977, Ser. No. 789,607
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1974, 2432956
Int. Cl.[2] A62B 35/00; B65H 75/48
U.S. Cl. 242—107.2 4 Claims



1. A vehicle safety belt retractor, comprising:
a. a housing;
b. a winding drum being rotatably mounted on said housing;
c. belt means attached to said winding drum for protraction and retraction with respect thereto;
d. clamp means for clamping said belt to prevent sudden protraction thereof, said clamp means including:
(i) a first fixed planar clamping surface;
(ii) a lever pivotally mounted at one end thereof; and
(iii) a second displaceable planar clamping surface carried by the intermediate portion of said lever for movement from a rest position toward said fixed clamping surface to clamp the belt therebetween;

e. resilient means coupled to said lever for biasing said lever for movement about its pivot in a direction to urge the second clamping surface carried by said lever away from said first clamping surface;

f. first guide means mounted adjacent said one end of said lever for guiding said belt means;

g. second, displaceable, guide means carried by the other end of said lever for entrainment of said belt means thereabout, and operating in response to preselected abnormal tension of said belt to pivot said lever and thereby move said second clamping surface toward said first clamping surface;

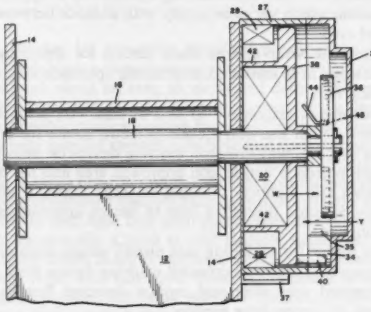
said belt means normally extending off said winding drum to said first guide means, past said pivot, thence between said clamping surfaces without contact therewith and thence over said second guide means whereby in normal operation the retractor allows always free winding and unwinding of the belt between said clamping surfaces without contact therewith, but where a predetermined abnormal tension on the belt applies a force to said lever via the second guide means to actuate said lever into its clamping position against the bias of said resilient means in a substantially normal direction with no wedging action, said planar clamping surfaces being substantially parallel to the plane of the web at the point of contact therewith.

4,120,467

COMFORT MECHANISM FOR SEAT BELT RETRACTOR

Robert Larry Stephenson, Sterling Heights, Mich., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Apr. 27, 1977, Ser. No. 791,617
Int. Cl.² B65H 75/48
U.S. Cl. 242—107 **10 Claims**



1. A safety belt retractor comprising a frame;

a spool mounted for rotation on said frame and having seat belt webbing wound thereon;

first means biasing said spool in a rewind direction;

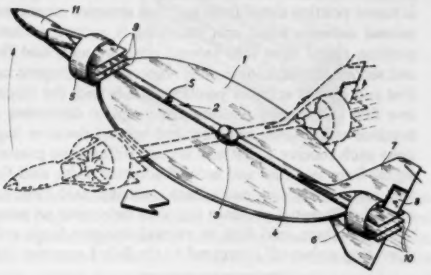
and means for reducing the tension of said belt against the wearer due to the bias force of said first biasing means, said tension reducing means comprising a second means biasing said spool in a rewind direction, said second biasing means having a lower biasing force than said first biasing means, means for activating said tension reducing means upon a retraction movement of a withdrawn seat belt followed by a slight further extension of said belt and a subsequent slight additional retraction of said belt from said further extended position, said activating means including means for blocking out the rewind bias of said first biasing means and permitting said second biasing means to apply its lesser rewind force to said spool.

4,120,468

REMOTELY PILOTED VEHICLE

Hans-Otto Fischer, Willich, Fed. Rep. of Germany, assignor to Rhein-Flugzeugbau GmbH, Monchengladbach, Fed. Rep. of Germany

Continuation of Ser. No. 630,020, Nov. 7, 1975. This application Feb. 10, 1978, Ser. No. 876,576
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1974, 2455687
Int. Cl.² B64C 3/12
U.S. Cl. 244—13 **10 Claims**



1. Remotely piloted aircraft of the aerodynamic lift variety and constructed for rapid action course changes with little or no banking comprising, a plane disc for establishing and providing substantially all the aerodynamic lift of said aircraft during forward motion without rotation of the disc, and independently from any rotation of the disc; and

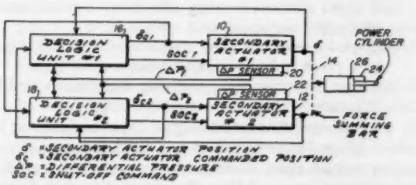
a fuselage without wings and static lifting power and being mounted on the disc for unrestrained turning in its entirety, the fuselage having (a) propulsion means for producing thrust in the direction of extension of the fuselage; (b) means for control of the aircraft including turning of the thrust producing fuselage in relation to the disc for changing the direction of flight; (c) a payload housing; and (d) a center of gravity displaced in forward direction of an axis of turning of the disc; the direction of thrust production being changed upon turning of the fuselage on the disc.

4,120,469

IN-LINE ACTUATOR MONITORING AND CONTROL APPARATUS

Theodore F. Westermeier, St. Charles, Mo., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 10, 1977, Ser. No. 776,391
Int. Cl.² G05D 1/00
U.S. Cl. 244—194 **5 Claims**



1. An in line monitoring and control apparatus comprising in combination:

first and second actuator units arranged in a redundant configuration, said first and second actuator units being hydraulically operated and controlled by electrical input signals respectively, said first and second actuator units

having their respective output force applied to a force summing means, said first and second actuator units each operating on a differential pressure, said first and second actuator units each providing an actuator position signal, and

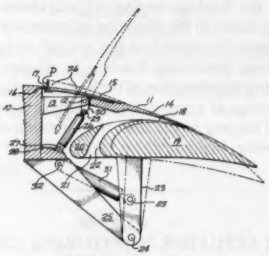
first and second decision logic units to respectively provide control signals to said first and second actuator units, said first decision logic unit providing a first control command and a first position command to said first actuator unit, said second decision logic unit providing a second control command and a second position command to said second actuator unit, said first decision logic unit receiving a first actuator position signal from said first actuator means, said second decision logic unit receiving a second actuator position signal from said second actuator unit, said first and second decision logic units respectively compare said first and second actuator position signals with the respective first and second position command to determine an actuator unit failure, said first and second decision logic units each receive a first and second differential pressure signal from said first and second actuator units, said first and second decision units each utilizing said first and second differential pressure signal to determine an actuator unit failure, said first or second decision logic units providing a shut-off command to the failed actuator unit.

4,120,470

EFFICIENT TRAILING EDGE SYSTEM FOR AN AIRCRAFT WING

Philip Charles Whitener, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 28, 1976, Ser. No. 727,507
Int. Cl.[2] B64C *9/20, 21/08*
U.S. Cl. 244—213 **3 Claims**



1. A trailing edge apparatus for an airplane wing having fixed structure with an upper aerodynamic surface, said apparatus comprising:

a spoiler assembly having an upper aerodynamic surface and a trailing edge; and

a flap assembly having an upper aerodynamic surface;

said upper surfaces forming effectively a continuation of said upper surface of said wing;

said spoiler assembly being attached to said fixed structure by a pivot and two parallel links;

said flap assembly being pivotally attached to said fixed structure; said spoiler assembly comprising:

a first rigid element having an upper surface and being pivotally connected to said fixed structure;

a second rigid element having an upper surface and being powered-hingedly attached to said first rigid element;

a flexible element having a forward edge, an aft edge and an upper surface and being attached at said aft edge to said first rigid element and extending forward so that said forward edge slidably engages said fixed structure, said forward edge being held in said engagement by said parallel links;

said upper surfaces in combination forming the aft upper surface of said wing;

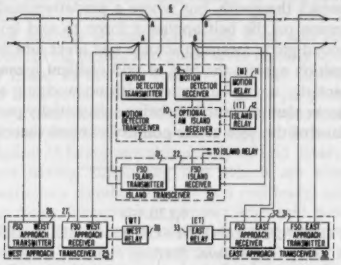
actuating means adapted to adjust the positions of said spoiler assembly and said flap assembly relative to each other and to said fixed structure, said flexible element flexing during said adjustments so that said upper aft surface of said wing is smoothly curved at all adjustment positions.

4,120,471

HIGHWAY CROSSING SYSTEM WITH IMPROVED RING SUSTAIN FEATURE

John H. Auer, Jr., Fairport, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Jun. 21, 1977, Ser. No. 808,592
Int. Cl.[2] B61L *29/32*
U.S. Cl. 246—128 **13 Claims**



1. A highway crossing warning system in combination with a highway crossing warning device comprising:

motion detector means coupled to track rails adjacent said crossing for detecting approaching train motion, said motion detector means having a sensitivity to approaching motion which varies inversely with distance between train and crossing,

at least one wrap-around track circuit for detecting train presence in at least a corresponding approach area of said track rails,

circuit means responsive to said at least one wrap-around track circuit and said motion detector means for energizing said highway crossing warning device on detection of train presence within said approach area and for deenergizing said highway crossing warning device if said motion detector thereafter fails to detect approaching motion, and

delay means for inhibiting said circuit means from de-energizing said highway crossing warning device for a predetermined time after said motion detector first indicates lack of approaching motion.

4,120,472

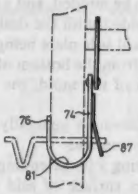
LADDER CADDY WITH RUNG CATCH MEANS

John Alfred Balne, 1247 Haig Blvd., Mississauga, Ontario, Canada

Filed Sep. 1, 1977, Ser. No. 829,789
Int. Cl.[2] E06C *7/14*
U.S. Cl. 248—211 **10 Claims**

1. In a ladder caddy, for use with house ladders of the type having opposed side rails and a plurality of rungs extending therebetween, said caddy having a frame portion comprising a rigid J-frame having a long limb and a short limb, said limbs forming a bight therebetween to straddle over a said ladder side rail when in use with an erected ladder to locate said side rail in partially entered relation between said limbs, each said limb having a bore therethrough, the bores being in mutually aligned relation to receive an appliance support spindle in substantially horizontally extending relation therethrough in

load transfer relation with said rigid J-frame, and rung catch means attached to said long limb and extending therefrom to



engage a said rung, to pivotally secure said J-frame in stable mounted and load supporting relation upon said ladder.

4,120,473

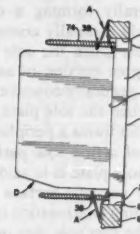
MOUNTING BRACKET FOR ELECTRICAL BOXES

Eugene J. Suk, Pittsburgh, Pa., assignor to Midland-Ross Corporation, Cleveland, Ohio

Division of Ser. No. 745,396, Nov. 26, 1976. This application Feb. 13, 1978, Ser. No. 876,868

Int. Cl.[2] H02G *3/08*; F16B *2/24*

U.S. Cl. 248—205 R **3 Claims**



1. A bracket for mounting electrical boxes or the like to walls comprising a base having a screw receiving opening therethrough along an axis, an elongated deformable portion extending from said base generally along said axis, a flange on said deformable portion spaced from said base and extending substantially parallel thereto, a hole in said flange around said axis for threadably receiving a screw extended through said opening, a sharp bend in said deformable portion intermediate said base and flange, a shallow bend in said deformable portion intermediate said base and said sharp bend, said deformable portion transversely scored at said shallow bend, said sharp and shallow bends being in opposite directions, opposite legs extending from said base in a direction opposite from said deformable portion, flat wing portions extending outwardly from said legs substantially parallel to said base, and hook portions extending from said wing portions toward said base and terminating at hooks adjacent said base.

4,120,474

DRAPERY SUPPORT ASSEMBLY

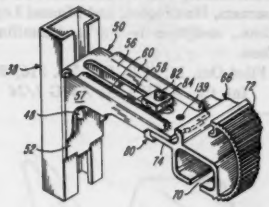
Glen A. Hurley, Dayton, Ohio, assignor to Hurley's Concepts, Inc., Dayton, Ohio

Filed Oct. 6, 1976, Ser. No. 730,017

Int. Cl.[2] A47H *1/10*

U.S. Cl. 248—263 **17 Claims**

1. An adjustable drapery support assembly comprising in combination a vertically extending frame member, means for securing one side of said frame member against a wall, an opposite side of said frame member bounding a longitudinal slot, a mounting bracket having a bracket leg adapted to lie facially against and slidably engage said opposite side and a bracket arm projecting outwardly from said opposite side at substantially a right angle to said leg and adapted for supporting drapery rodding, said arm having depending side walls bearing against said leg, rib means extending along sides thereof and projecting outwardly therefrom for resisting bending movements of said arm, and a longitudinally extending slot disposed between said rib means, the end of said arm remote from said leg being deflected outwardly to form a hook portion, a nut bearing against said opposite side and slidable longitudinally of said frame member, a fastener passing through an



aperture in said leg between said side walls and engaging said nut through the slot bounded by said opposite side for fixedly securing said leg in facially contacting relation to said opposite side, and an extension arm overlying said bracket arm, fastener means passing through said slot of said bracket arm for securing an end of said extension arm disposed adjacent said frame member to said bracket arm, said extension arm overlying said hook portion.

4,120,475

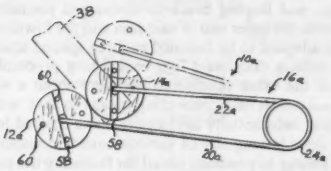
BOOK HOLDING APPARATUS

Peter P. Penner, 31862 Carlsrue, Clearbrook, B.C., Canada

Filed Nov. 1, 1976, Ser. No. 737,739

Int. Cl.[2] A47B *97/04*

U.S. Cl. 248—451 **6 Claims**



1. A book holding device comprising:

a. a mounting frame having a rear pivot end and a forward contact end, said frame comprising:

1. a base arm having a pivot end and a contact end, spaced from one another by a first greater base dimension,
2. a secondary arm having a pivot end and a contact end spaced from one another by a second smaller dimension,
3. said two arms having a spring connection at the pivot ends thereof to urge the contact ends of the arms toward each other to a contact position,
4. said mounting frame having a base axis extending from the pivot end of the base arm to the contact end thereof,

b. a base contact member mounted to the base arm at the contact end thereof and having a first contact surface adapted to engage one surface of a book at a first contact plane positioned at an angle with respect to said base axis,

c. a secondary contact member mounted to the contact end of the secondary arm member at a location rearwardly of the base contact member and having a second contact surface opposing the first contact surface at a second contact plane at an angle with respect to said base axis, said secondary contact member having a first contact position on one side of said base axis to engage a book at

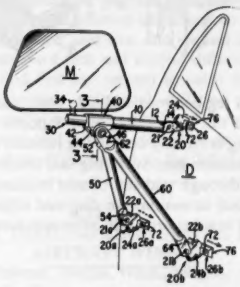
a first angle with respect to said base axis, and having a second contact position on the other side of said base axis so as to engage a book at a second angle with respect to said base axis, said spring connection being such as to urge said secondary contact member to an intermediate location proximate said base axis.

4,120,476

VEHICLE REAR VIEW MIRROR MOUNTING

Joseph R. Bourassa, Huntington, and Manuel Lopez, Trumbull, both of Conn., assignors to Par'ker-Hannifin Corporation, Shelton, Conn.

Filed Oct. 21, 1974, Ser. No. 516,759
Int. Cl.[2] A47F 5/00; A47G 1/24
U.S. Cl. 248—486 **3 Claims**



1. A vehicle door rear view mirror mounting comprising an arm adapted to protrude substantially horizontally from a vehicle door, a mirror support held by an outer end portion of said arm, two legs diverging each from the other in downward direction, means connecting the respective upper ends of said legs pivotally with and in a fixed location on the outer end of said arm, and footing brackets connected pivotably, respectively, with the inner end of said arm and the lower ends of said legs and adapted to be fastened at three spaced apart locations on the vehicle door, said legs each being pivotable independently of the other relative to said arm about a substantially horizontal axis at said connecting means so that, with said arm protruding substantially horizontally at a desired level from a vehicle door having any of various outside contours, said legs may be swung to positions suited for fastening the said brackets thereon onto the vehicle door, the axes of the respective pivotable connections of said legs with said arm and of said brackets with said arm and said legs being substantially parallel and normally being substantially horizontal, whereby a mirror on said support may be mounded readily in a desired viewing position on a vehicle door having any of various outside contours, each of said footing brackets comprising a head member pivotably connected to the respective arm end or leg end and a mating plate member adapted to be fixed to the vehicle door at one of said three locations, one of said members comprising a horizontally elongate rail portion and the other of them having a horizontally elongate channel therein to receive slidably and retain said rail portion, and means on said head member for fastening it against displacement relative to said plate member when said rail portion is engaged in said channel.

4,120,477

MOLD AND METHOD FOR INJECTION MOLDING A SOLE ONTO A SHOE UPPER

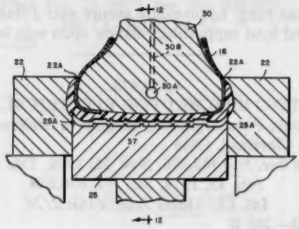
Juan Justamante, Hialeah, Fla., assignor to Suave Shoe Corporation, Miami Lakes, Fla.

Filed May 26, 1977, Ser. No. 800,659
Int. Cl.[2] B29C 1/00; B29F 1/12
U.S. Cl. 249—109 **4 Claims**

1. In a mold for injection molding a sole onto an upper, the mold comprising longitudinally extending ring plate means which define the mouth of the mold in which a lasted shoe upper may be sealingly engaged, the inner faces of said ring plate means having the contour of the sides of the peripheral portion of the bumper to be molded, and a sole plate the upper surface of which is provided with the design to be formed on the bottom of the sole, said sole plate being adapted for movement towards and away from the bottom of a lasted shoe upper positioned in the mouth of the mold, the improvement comprising,

the ring plate means having a generally concave inner surface at its upper portion and

the sole plate compirising a fin extending upwardly about its periphery, the inner surface of said fin being generally



concave and generally forming a continuation of the lower portion of said generally concave inner surface of the ring plate means when the sole plate is in a lower position and the upper portion of said fin being spaced inwardly from said generally concave inner surface of the ring plate means when the sole plate is in an upper position, whereby said fin forms a peripheral groove adjacent to the lower side of a first sole part which is injection molded when the sole plate is in said upper position and the inner generally concave surface of said fin forms a downwardly extending continuation of the peripheral face of the bumper of the first sole part on a second sole part which is injection molded when the sole plate is in said lower position.

4,120,478

GAS-HYDRAULIC PRESSURE TYPE ACTUATOR FOR PIPELINE VALVE

Akira Hasegawa, Yokohama, Japan, assignor to The Japan Steel Works, Ltd., Tokyo, Japan

Filed Dec. 6, 1976, Ser. No. 747,853
Claims priority, application Japan, Dec. 8, 1975, 50-146517; Jul. 8, 1976, 51-81680
Int. Cl.[2] F16K 31/143, 31/12; F15B 15/22
U.S. Cl. 251—31 **5 Claims**

1. An actuator assembly for opening and closing a gas pipeline valve (2), comprising:

(a) an actuator cylinder (4),

(b) a pair of spaced pistons disposed in the cylinder and coupled together for joint movement in the cylinder by a connecting rod (4b),

(c) means (3) coupling the connecting rod to the pipeline valve,

(d) a selective pressure supply valve (12),

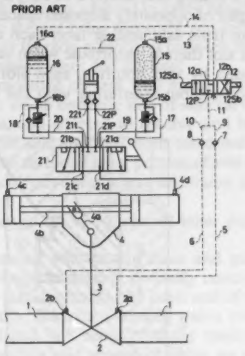
(e) means (5, 6) coupling gas pressure from the pipeline to an input port of the supply valve,

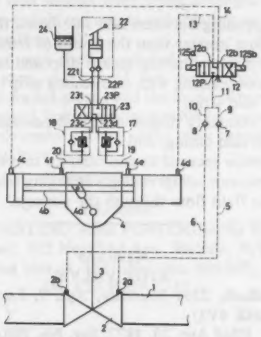
(f) means (13, 14) individually coupling output ports of the supply valve to opposite ends of the actuator cylinder on the piston face side of each piston, whereby gas pressure may be applied directly to a selected end of the cylinder to drive the coupled pistons and open or close the pipeline valve,

(g) a pair of flow control valves (17, 18),

(h) a change-over valve (23) connected in series between the flow control valves, and

(i) hydraulic circuit means (19, 20) individually and directly connecting the respective flow control valves in series between hydraulic chambers defined in the actuator cylinder on the connecting rod side of each piston, whereby





hydraulic fluid is transferred from one chamber to the other through the flow control valves in response to the movement of the coupled pistons, and the flow control valves thereby regulate the speed of the coupled pistons.

4,120,479

RISING STEM VALVE ACTUATOR

Richard L. Thompson; Murray J. Hubbert, and Vernon J. Wade, all of Houston, Tex., assignors to Bettis Corporation, Houston, Tex.

Filed Apr. 15, 1977, Ser. No. 787,882
Int. Cl.[2] F16K *31/124*
U.S. Cl. 251—56 **1 Claim**

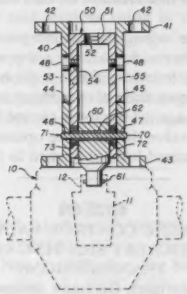
1. A valve actuator comprising:

a cylinder carrying a 2-way piston and piston rod depending from said piston rod having means at one end thereof for attachment to an input sleeve;

a mounting sleeve adapted to be fixed both to said cylinder and to a valve, said mounting sleeve having a first opposed pairs of slots of L-shaped configuration and a second opposed pair of axially oriented slots;

an input sleeve, adapted to be attached to said piston rod, movably positioned within said mounting sleeve, said input sleeve carrying opposed rollers for preventing, in combination with said axially oriented slots, relative rotation of said sleeves, said input sleeve also having an opposed pair of arcuately configured slots; and

an output member carrying a pin, the opposed ends of said pin extending through both said pair of arcuately configured slots of said input sleeve as well as through said pair of L-shaped slots in said mounting sleeve and said output



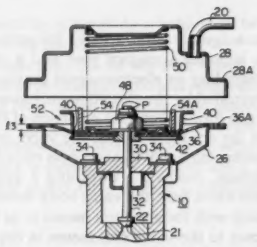
member also having means adapted to fix said output member to a valve.

4,120,480

VALVE DEVICE FOR AN EXHAUST GAS RECIRCULATION SYSTEM OF AN INTERNAL COMBUSTION ENGINE

Masahisa Ando, Aichi; Keigo Katow, Toyota, and Masami Yamazaki, Toyokawa, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 16, 1976, Ser. No. 696,856
Claims priority, application Japan, Feb. 24, 1976, 51-18419
Int. Cl.[2] F16K *31/126*; F02M *25/06*
U.S. Cl. 251—61.5 **2 Claims**



1. A valve device for an exhaust gas recirculation system of an internal combustion engine, which comprises:

a body having a first passageway adapted for connection with the exhaust line of the engine and a second passageway adapted for connection with the intake line of the engine;

a valve member opening or closing a valve seat formed between said first and second passageways, and;

a diaphragm mechanism having a casing secured to said body, a diaphragm arranged across the interior of said casing so as to form at least one chamber on at least one side of said diaphragm, which chamber is adapted for connection with an engine port formed in said intake line to transmit a vacuum signal from the intake line to said chamber;

a set of plates disposed on both sides of the diaphragm;

a sleeve member having a stem portion and a flange portion, said sleeve member being inserted into said diaphragm disposed through the set of plates with the flange portion engaging one of said plates;

a nut screwed onto one end of said stem portion remote from said flange portion;

a rod, a first end of which is fixed to said valve member and

the other end of which is capable of being axially, slidably inserted to said sleeve member;

an arc weld between the rod and sleeve member fixing the sleeve member in a location on said other end of said rod, and;

a spring member urging the diaphragm in the longitudinal direction of the rod so that the valve member closes said valve seat, the location of said weld being such that said diaphragm allows said valve member to be detached from the valve seat against the force caused by said spring so as to allow said valve device to be opened, when a vacuum of a predetermined level is formed in the chamber.

4,120,481

ELECTROMAGNETIC CONTROL VALVE, ESPECIALLY FOR AUTOMATICALLY SHIFTING CHANGE-SPEED TRANSMISSIONS

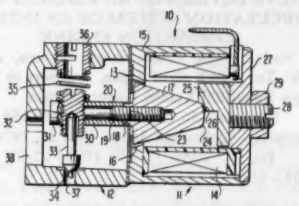
Arwed von Koch, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft

Filed Mar. 11, 1976, Ser. No. 665,861

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1975, 2511152

Int. Cl.[2] F16K *31/10*

U.S. Cl. 251—129 **30 Claims**



1. An electromagnetic control valve for pressure media, the control valve includes a magnet part and a valve part, the magnet part including an electromagnet means, and an armature means controlled by the electromagnet means, and at least one magnetic gap formed between a portion of the electromagnet means and the armature means, the valve part including a valve body means and a valve seat means cooperable with the valve body means, means for throttling a pressure medium flowing into the valve part, the valve body means being operatively connected with the armature means so as to be displaceable with respect to the valve seat means in dependence upon an energization of the electromagnet means to control an inflow of the throttled pressure medium into the valve part, and means for mounting the armature means and the valve body means so as to be pivotal about an axis located outside the magnetic gap, characterized in that a diaphragm means is mounted between the magnet part and the valve part for sealing said magnet part from said valve part, and in that the pivotal mounting means includes knife edge bearing means for suspending the armature means and valve body means at the diaphragm means at least approximately in a mass center of the armature means and valve body means.

4,120,482

FLUID SEAL

Derek Michael Cox, 76 Irvine Rd., Kilmarnock, Ayrshire, Scotland

Filed Jun. 16, 1977, Ser. No. 807,095

Int. Cl.[2] F16K *1/226*

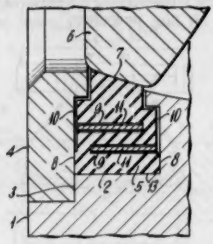
U.S. Cl. 251—306 **6 Claims**

1. A valve for controlling fluid flow comprising:

a. a valve casing having a fluid passage therethrough, one end of said casing having an annular notch adjacent the pasage and, a shoulder adapted to receive a retaining ring;

b. a retaining ring removably secured to said shoulder, said ring and notch defining a groove adapted to receive a sealing strip;

c. a sealing strip, said strip positioned in the groove and adapted to be compressed by an obturator, said strip including: a sealing face adapted to cooperate with an obturator; a pair of oppositely disposed spaced-apart side faces extending from said sealing face, each of said side faces having a slot therein distortable when said sealing strip is compressed by said obturtor, each slot overlapping the other slot without interfering with the other slot; and a



base extending between said side faces, the width of said base being greater than the width of either of the slots;

d. a deformation-limiting means disposed in each slot, said means cooperating with said sealing strip to limit deformation of said strip;

e. a stem rotatably disposed in said passage and extending through said casing; and,

f. an obturator secured to said stem for movement therewith, said obturator compressingly engaging said sealing strip to regulate fluid flow through the passage.

4,120,483

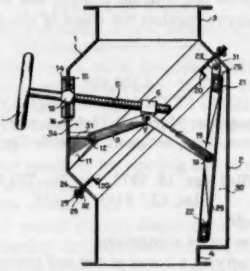
STOP VALVE

Jacques LeRoch, 2261 Marmier, Apt. 7, Longueuil, Quebec, Canada (J4K 4V1)

Filed Apr. 25, 1977, Ser. No. 790,651

Int. Cl.[2] F16K *31/44, 31/50*

U.S. Cl. 251—229 **8 Claims**



1. A stop valve, comprising:

a valve body defined by wall means, and having a longitudinal axis;

divider plate means extending across the interior of said valve body and dividing it into first and second chambers, said divider plate means lying at an angle to said longitudinal axis and carrying a valve seat means;

a valve plate received within said first chamber and pivotally mounted at a location along one side of said valve body to be movable between a closed position in engagement with said valve seat means, and an open position swung away from said valve seat means toward said one side of said valve body; and

control means operable for moving said valve plate between said open and closed positions thereof, said control means including:

a shaft, having an outer end disposed outside said valve body and an inner end portion within said valve body, the outer end of said shaft being adapted to carry handle means, the inner portion thereof being threaded, and said shaft carrying ball means thereon positioned between said outer end and said threaded inner end portion;

socket means mounted on said wall means within said second chamber on an opposite side of said valve body from said one side, and adapted to receive said ball means to thereby mount said shaft for both rotational and pivotal movement, the threaded inner portion of said shaft extending toward said valve seat where said valve is in said open position;

nut means received on said threaded inner portion of said shaft; and

a first and a second link, having inner and outer ends the inner ends of said links being pivotally connected to each other and to said nut means, the outer end of said first link being pivotally connected to said valve plate, and the outer end of said link being pivotally connected to said wall means within said second chamber on said opposite side of said valve body,

said first and said second links being arranged to define a "V" relative to said nut means and forming an angle therebetween less than 180°,

whereby when said shaft is rotated in a first direction to close said stop valve, said nut means will be moved toward said socket means and the angle between said first and said second links will progressively become smaller, effecting movement of said valve plate toward its closed position, and vice versa.

4,120,484

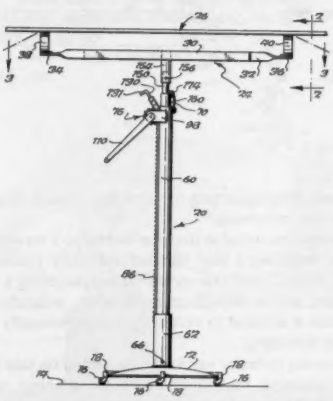
PANEL HOISTING AND POSITIONING DEVICE

James H. Zimmer, 312 Newfield Ave., Buffalo, N.Y. 14207

Filed Nov. 9, 1977, Ser. No. 849,889

Int. Cl.[2] B60P *1/12*

U.S. Cl. 254—6 C **14 Claims**



1.A panel hoisting and positioning device comprising:

(a) a maneuverable base;

(b) a raising and lowering means having a stationary component fixed to said base and a movable component operatively associated with said stationary component and adapted to be raised and lowered relative to said base; and

(c) panel supporting means connected to said raising and lowering means including bar means connected generally centrally thereof to said movable component of said raising and lowering means and disposed generally perpendicular to the direction said component is raised and lowered and first and second panel engaging elements fixed to opposite ends of said bar means, each of said panel engaging elements having a shape such that it contacts a panel at two spaced apart panel contacting sections of said element, each of said sections being in the form of a strip having a convex curvature along the length of the strip in a direction facing the panel, each of said sections contacting the panel along the entire width of the strip, and each of said panel engaging elements being flexible at least in the portions thereof including said panel contacting sections.

4,120,485

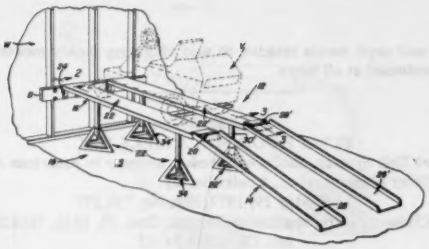
FOLDING RACK AND WORK TABLE

Joseph W. McConnell, 9722 W. 136 La., Cedar Lake, Ind. 46303

Filed Nov. 1, 1977, Ser. No. 848,568

Int. Cl.[2] E02C *3/00*

U.S. Cl. 254—88 **11 Claims**



1. A service rack and work table unit, comprising, in combination:

(a) rack means for supporting a vehicle to be serviced and including a planar table surface; and

(b) ramp means attached to the rack means for permitting the vehicle to be brought onto and removed from the rack means, the rack means including attachment means pivotally mounting the rack means on a support for swinging movement between a storage position wherein the planar table surface is substantially vertical and a work position wherein the planar table surface is substantially horizontal.

4,120,486

METHOD AND APPARATUS FOR THE SLIP-FREE HAULING OF A ROPE OR THE LIKE

Walter Mehnert, Ottobrunn, Fed. Rep. of Germany, assignor to Director Ing. Fritz Loertscher, Flums/SG, Switzerland

Filed Jan. 24, 1977, Ser. No. 761,880

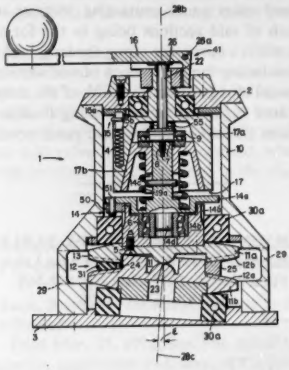
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1976, 2603202; Aug. 5, 1976, 2635267

Int. Cl.[2] B66D *1/30*

U.S. Cl. 254—150 R **36 Claims**

1. An apparatus for the slip-free hauling of rope means, comprising housing means, clamping pulley means in said housing means, braking means, relative arresting means operatively connecting said clamping pulley means with said braking means, means operatively connecting said clamping pulley means to said relative arresting means, control means, absolute arresting means operatively connecting said control means with said housing means, auxiliary means operatively connecting said control means to said relative arresting means, first and second spring means operatively connecting said braking means to said absolute and relative arresting means, respectively, whereby said housing means operatively position said recited means, said control means being adapted to initiate and

control the braking, releasing, and arresting of said slip-free hauling in such a manner that a looping angle of less than 360° of said rope means relative to said clamping pulley means is maintained at all times.

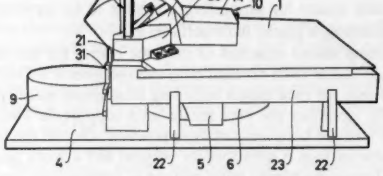


4,120,487

FUME HOOD FOR A MELT POT

Karl-Erik Sjogren, Sandared, Sweden, assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed May 19, 1977, Ser. No. 798,377
Claims priority, application Sweden, Dec. 20, 1976, 7614284
Int. Cl.² F27B *14/02*
U.S. Cl. 266—158 **13 Claims**



1. Apparatus for collecting and removing smoke and fumes from a melting furnace plant comprising: a platform tiltably supported by stationary supporting members, the tilting axis being near one edge of the platform, a furnace rigidly connected to the platform, said furnace having a furnace chamber open at the top and accessible through a charging orifice in the platform, said furnace having a pouring spout connected to the upper part of the side wall of the furnace and located near the tilting axis;

(a) a hood pivotably supported by supporting members attached to said platform, said hood being angularly movable towards and away from a portion of the platform thereby surrounding the charging orifice of the platform in its lowered position, the pivot axis of said hood being parallel with the tilting axis of the furnace and extending at the same side of the furnace as said tilting axis,

(b) a pair of parallel wall members arranged on the upper surface of said platform and extending at right angles to said tilting axis, said wall members extending from the edge of the platform which is near the tilting axis along the platform and having such a vertical extension with respect to the plane of the platform as in any angular position of said hood, the hood together with said wall members and with the upper surface of the platform define a cowl facing said charging orifice,

(c) a first air duct attached to said platform,

(d) a second air duct supported by stationary supporting members, said first air duct having an inlet orifice connected to said cowl and an outlet orifice surrounding said tilting axis, said outlet orifice being connected to and freely rotatable with respect to an inlet orifice of said second air duct,

(e) the end of said hood which is nearest to the pivotal axis of the hood forms a second cowl, the orifice of which is located, when said hood is in its bottom position with reference to the platform, near a vertical plane through the pivot axis of the hood, and,

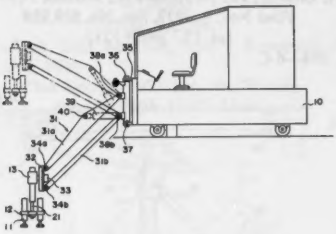
(f) a second hood adapted to said orifice of the second cowl and arranged to be angularly displaceable into and out of said first mentioned hood, said second hood being pivotal about the axis of said first hood.

4,120,488

STAMPING APPARATUS FOR APPLYING LINING MATERIAL TO IRON RUNNERS

Motohiko Iizuka, Fukuyama; Hiroyuki Danjo, Bizen; Kazuo Ikeda, Fukuyama, and Masatoshi Yoshimura, Kasaoka, all of Japan, assignors to Shinagawa Shirorenga Kabushiki Kaisha; Nippon Kokan Kabushiki Kaisha, both of Tokyo; Kabushiki Kaisha Ikeda Kikai Seisakusho and Shinagawa Roko Kabushiki Kaisha, both of Fukuyama, all of Japan

Filed Jan. 19, 1978, Ser. No. 871,481
Claims priority, application Japan, Feb. 4, 1977, 52-10635
Int. Cl.² C21B *7/00*
U.S. Cl. 266—281 **4 Claims**



1. A stamping apparatus for applying a lining material to an iron runner comprising:

arm means mounted at the base thereof to a travelling device and including a base member vertically mounted to one end thereof, said arm means further including a link mechanism and a swivelling mechanism, whereby said arm means is adapted to vertically and horizontally move said base member;

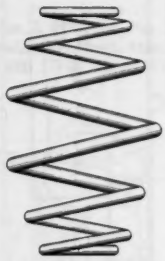
a balancing cylinder vertically supported on said base member through the intermediary of turnning means, said balancing cylinder holding therein a piston by upper and lower cylinder chambers, said balancing cylinder including compressed air inlet means, setting regulator means and main control regulator means for maintaining the pressure in each of said cylinder chambers at a setting pressure and a piston rod whereby maintaining constant the pressing force of at least one rammer mounted to one end of said piston rod, said balancing cylinder being rotatable so as to be held horizontally as well as in an inclined position; and

said at least one rammer mounted to said piston rod in parallel with said balancing cylinder.

4,120,489
DOUBLE TRUNCOCONICAL SPRING OF WIRE WITH CIRCULAR CROSS SECTION

Arthur Borlinghaus, Berghausen, Germany, assignor to Bebrueder Ahle, Karlsthal Post Berghausen, Germany

Continuation-in-part of Ser. No. 48,348, Jun. 22, 1970. This application Mar. 30, 1973, Ser. No. 346,531
Int. Cl.[2] F16F *1/04*
U.S. Cl. 267—61 R 1 Claim

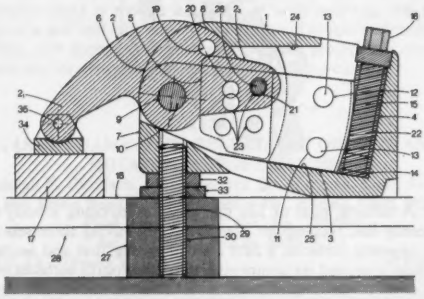


1. A double truncoconical spring made of wire having a circular cross section, the coil having the greatest diameter being toward the middle of the spring, the coils of one half of said spring, under maximum load, being positioned inside one another in the form of a spiral, said spring having a partially progressive characteristic, said spring composed of wire whose diameter is greatest in the middle of the spring and whose diameter diminishes towards both ends of the spring in a ratio such that the condition of maximum stress is fulfilled for each coil and, as loading increases, the inner coils lay themselves progressively against the bearing surfaces at the ends of the spring.

4,120,490
CLAMPING DEVICE FOR A MACHINE TOOL

André Carossino, B.P. #755, 95004 Cergy Cedex, France

Filed Mar. 7, 1978, Ser. No. 884,306
Claims priority, application France, Mar. 10, 1977, 77 07067; Jan. 23, 1978, 78 01765
Int. Cl.[2] B23Q *3/06*
U.S. Cl. 269—94 12 Claims

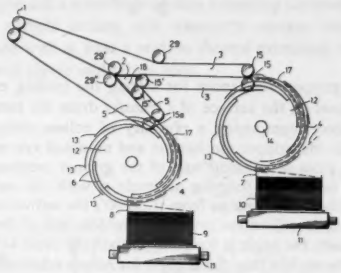


1. A device for clamping work to be machined on a table of a machine tool, the device comprising means defining a body in the form of a housing, anchoring means for fixing it to the table of the machine tool, a pivotal jaw mounted on the housing to pivot about an axis, actuating means mounted on the housing to be accessible from outside the housing, an independent lever which extends the jaw and is mounted on the housing to pivot about said axis, means coupling the lever to the actuating means for pivoting the lever about said axis, the jaw and the lever being relatively pivotable about said axis, and detachable coupling means for rendering the jaw and lever rigid with each other in different selectable relative angular positions so as to pivot together when the actuating means is brought into action.

4,120,491
SHEET STACKING APPARATUS

Hans Friedrich Lang, Landau, Germany, assignor to Gustav Weyland KG, Landau, Pfalz, Germany

Filed May 27, 1977, Ser. No. 801,071
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1976, 7619535[U]
Int. Cl.[2] B65H *29/58*
U.S. Cl. 271—64 2 Claims



1. An apparatus for stacking sheets in a rotary printing press, which comprises the combination of

(a) a conveyor band means having a delivery end for conveying successive ones of the sheets to the delivery end,

(b) a sheet receiving drum mounted for rotation adjacent the delivery end of the conveyor band means, the drum comprising

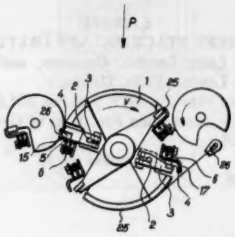
(1) a plurality of like axially spaced discs, each disc having a series of spirally extending, equidistant pockets distributed uniformly about the periphery thereof, each pocket defining an inlet opening for receiving a respective one of the sheets from the delivery end as the drum rotates successive ones of the inlet openings into sheet receiving relationship with the delivery end, the inlet openings of the pockets of all discs being in alignment,

(c) stripper elements mounted peripherally spaced from the delivery end of the conveyor band means at a sheet stacking station and extending between the discs of the sheet receiving drum whereby an inner end of each successive sheet is stopped by the stripper elements as the drum rotates and brings the inner sheet end into engagement with the stripper elements and further rotation of the drum strips the successive sheets out of the pockets wherein they have been received and stacks the successive sheets,

(d) sheet guide elements mounted between the discs and surrounding a substantial portion of the periphery of the drum and extending to the delivery end of the conveyor band means, the sheet guide elements ending before the stacking station to enable the successive sheets to fall from their pockets, and

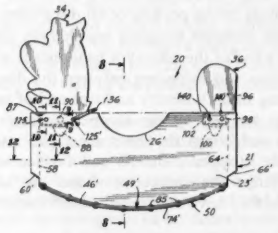
(e) a sheet guide element extending outwardly and tangentially to the drum at each inlet opening of the pockets, the sheet guide elements cooperating to provide closed pockets for the respective sheets during rotation of the drum from the delivery end to the stacking station.

4,120,492
GRIPPER MECHANISM
Arnošt Černý, Blansko, Czechoslovakia, assignor to Adamovske strojirny, narodni podnik, Adamov, Czechoslovakia
Filed Aug. 8, 1977, Ser. No. 822,898
Claims priority, application Czechoslovakia, Aug. 16, 1976, 5311/76
Int. Cl.[2] B65H 5/12
U.S. Cl. 271—277 5 Claims



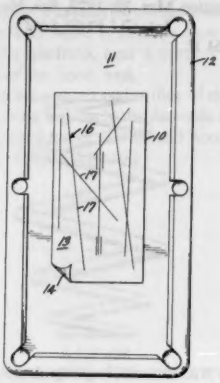
1. A gripper mechanism for seizing the trailing edge of a paper sheet on the surface of a transfer drum for turning said paper sheet, comprising a plurality of rollers obliquely arranged in the gripper mechanism and mounted symmetrically on both sides of a middle axis of the gripper mechanism, the axes of the rollers forming an angle α with the axis of the gripper shaft in the range from 0° to 30°, the individual angles α opening in a direction toward the middle axis of the gripper mechanism, the angle α for rollers relatively close to the middle axis being less than the angle α for rollers relatively remote therefrom.

4,120,493
COLLAPSIBLE ROCKING TOY
Irving Sommer, Commack, N.Y., assignor to Toy Professionals Unlimited, Inc., Commack, N.Y.
Filed Feb. 9, 1977, Ser. No. 767,195
Int. Cl.[2] A63G 17/00
U.S. Cl. 272—52 16 Claims



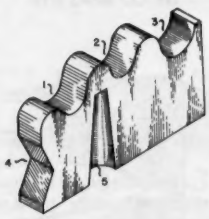
1. A rocking toy comprising, side panel means, said side panel means being pivotally joined at the top thereof along a longitudinally extending line, and each having an arcuate lower end formed with an outwardly folded peripheral flange for rocking thereof, base panel means secured to and between the peripheral flanges of the lower ends of said side panel means, said base panel means being foldable about its longitudinally extending centerline for folding coordinate with the pivoting of said side panel means and seat means mounted to said said panel means.

4,120,494
POCKET BILLARD TRAINING DEVICE
Hjalmer E. Roe, 5948 Gany Mede Dr., Toledo, Ohio 43623
Filed Feb. 25, 1977, Ser. No. 772,245
Int. Cl.[2] A63D 15/00
U.S. Cl. 273—2 10 Claims



1. A pocket billiards training device for use on a billiard table having a playing area comprising, a layer of cloth material having an upper surface and a lower surface, said layer of material being of an area less than such playing area of such billiard table and identifying means on said upper surface of said layer of cloth material for guiding a player in making predetermined billiard shots, said lower surface including a nap for gripping such billiard table playing area.

4,120,495
BILLIARD HAND BRIDGE
Joseph R. Moughler, 85 Laurel Dr., Smithtown, N.Y. 11787
Filed Apr. 2, 1976, Ser. No. 672,985
Int. Cl.[2] A63D 15/00
U.S. Cl. 273—23 1 Claim



1. A billiard, pool or like cue guide comprising a body of generally flat, rectangular, slab-like form, having three sets of two opposite surfaces, a first set comprising first and second surfaces, a second set comprising third and fourth surfaces and a third set comprising fifth and sixth surfaces, each of said first, third and fifth surfaces having at last one cue guiding groove and said second, fourth, and sixth surfaces being constituted as means for supporting said body on a flat surface and being substantially mutually perpendicular, said first surface comprising a long side of said slab-like body and said second surface comprising an opposite long flat side of said body, said first surface having three cue guiding grooves, the spacing of bases of those grooves from said second surface each being different; said third surface comprising a relatively short side of said slab-like body having a single cue guiding groove therein and said fourth surface comprising an opposite short flat surface of said body; said sixth surface comprising a large

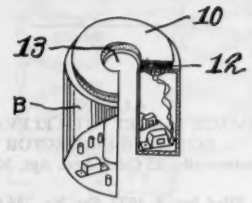
flat surface and said fifth surface comprising an opposite surface having a single, relatively long, cue guiding groove formed therein, said last mentioned groove having a base inclined to the plane of said sixth surface and constituting means, when said sixth surface is disposed on a rail of a pool table, for guiding a cue in playing a ball close to said rail.

4,120,496

GOLF CUP WITH SOUND PRODUCING DEVICE

Yozo Niina, No. 562, Tozinmachi, Usuki City, Oita Prefecture, Japan

Filed Mar. 2, 1977, Ser. No. 773,558
Claims priority, application Japan, Mar. 5, 1976, 51-23089
Int. Cl.[2] **A63B** *57/00, 69/36;* **G11B** *15/00*
U.S. Cl. 273—34 R **2 Claims**



1. In combination, a golf cup having drainage holes in the bottom thereof, a projection projecting upwardly from the bottom of said golf cup, an annular circuit box on said projection, the hollow center of said circuit box being a flagstick base receiving hole, the top of said circuit box being a metal contact, an annular sponge on said top and having a plurality of apertures therein extending through the thickness of said sponge, a metal conact plate on the top surface of said sponge and having a plurality of projections on the under side of said contact plate projecting into said apertures in said sponge and having the free ends spaced from said top when the sponge is in the uncompressed condition and contacting said top when said sponge is compressed, and a sound producing circuit within said circuit box having an energy source and a sound producing means and said top and said contact plate being coupled in said sound producing circuit as an actuating switch for said sound producing circuit, said sound producing circuit having means for keeping the circuit energized for producing a sound for a predetermined time after the projections on said contact plate is moved into contact with said top, whereby when a golf ball falls into said golf cup and strikes said terminal plate, said sponge is compressed and said projections contact said top for energizing said sound producing circuit.

4,120,497

TARGET GAME WITH RELEASABLE OBJECTS AND ROTATING TARGET MEMBER

Adolph E. Goldfarb, 4614 Monarca Dr., Tarzana, Calif. 91356, and Erwin Benkoe, 17965 Medley Dr., Encino, Calif. 91316

Filed Feb. 22, 1977, Ser. No. 770,606
Int. Cl.[2] **A63B** *63/06;* **A63F** *7/02*
U.S. Cl. 273—95 B **22 Claims**

14. A method of operating a toy for dropping one or more objects from a simulated airborne vehicle onto target positions, said method comprising:

(a) effecting selective movement along one path of a simulated airborne vehicle supported on an arm extending over a target area through manual actuation of a remote lever,

(b) causing continuous rotational movement generally transverse to said path by the target area which has a plurality of spaced apart identified target positions on its upper surface,

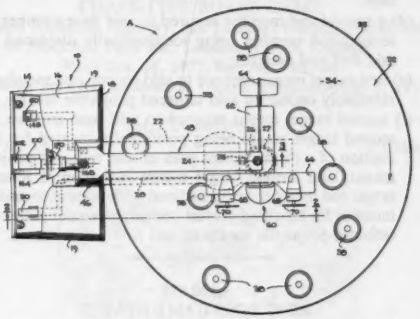
(c) sighting one of the target positions on the target area through a relatively short tubular stationary sight located remote from the vehicle, maintaining the sighting eye substantially stationary, and actuating said remote lever to effectuate said movement to move said vehicle and align a mirror located on said vehicle through said sight to bring into view one of said target positions, and

(d) releasing individual ones of a plurality of of objects carried by an elongate element on the vehicle through manual actuation of a remote release member when the vehicle has been shifted to a position relative to the target area, the action of releasing the objects occurring while the user of the toy operates the remote release member and simultaneously looks through the sight at a remote position from the vehicle to drop the object when the selected target position appears in the desired location through the sight and which target position is achieved through such selective movement of the vehicle.

17. A target toy comprising:

(a) means defining a generally horizontal target area disposed on a supporting surface, said target area rotating generally continuously,

(b) means defining a self standing base having an upright section and a transverse section extending outwardly from the upright section, said transverse section being positioned with at least a portion thereof extending over and spaced above said target area,



(c) an object carrier supported on said transverse section for movement therealong and over said target area,

(d) control means on said base selectively manually operable by a user to cause said movement of said carrier on said transverse section,

(e) at least one object releasably carried by said carrier,

(f) sighting means comprising a relatively short tubular sighting member on said base, an optical element mounted on said carrier and being optically aligned with said sighting member for the entire path of movement of said carrier on said transverse section to enable a user of the toy to look through the sighting member and to view a portion of the target area by means of the optical element, the length and cross section of said sighting member being such that the user's view through the sight will not extend beyond the limits of the optical element when the carrier is at its furthest position from the sighting member,

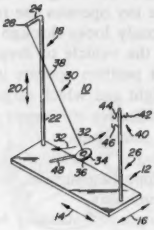
(g) release means on said base in close proximity to said control means and being selectively manually operable by a user to release an object from said carrier, said tubular sighting member being located in relation to said release means to enable a user of said target toy to simultaneously operate said release means while viewing a portion of the target area through said sighting member and in a position remote from said carrier.

4,120,498

AMUSEMENT SYSTEM

Steven C. Mutschler, 2070 Garden Springs Dr., Lexington, Ky. 40504, and Loane J. Randall, Naples, Fla., assignors to Steven C. Mutschler, Lexington, Ky.

Filed Apr. 26, 1977, Ser. No. 791,051
Int. Cl.[2] A63B 67/06
U.S. Cl. 273—99 **9 Claims**



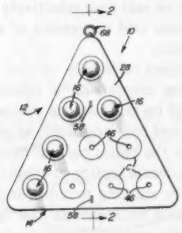
1. An amusement system comprising:
(a) a longitudinally extended base member;
(b) a first rod member secured to said base member, said first rod member extending in a substantially vertical direction above said base member;
(c) tethered projectile means secured to said first rod member;
(d) a second rod member secured to said base member, said second rod member being longitudinally displaced from said first rod member;
(e) first target means secured to said second rod member for releasably capturing said tethered projectile means; and,
(f) second target means secured to said base member, said second target means being positionally located for interception of a displacement path of said tethered projectile means, said second target means including at least one target rod member being inclined with respect to said base member for blocking at least one displacement path of said tethered projectile means to said first target means.

4,120,499

RING TOSS GAME DEVICE

Anthony N. Stazzone, 5703 Haverhill Dr., Parma, Ohio 44129

Filed Apr. 26, 1977, Ser. No. 791,018
Int. Cl.[2] A63B 67/06
U.S. Cl. 273—100 **6 Claims**



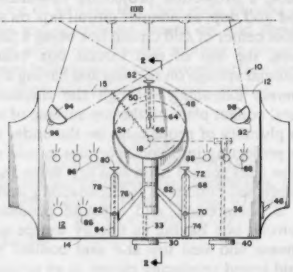
1. A ring toss game device, comprising, in combination:
(a) a game board including a frame forming means for removably receiving a peg;
(b) a peg removably mounted on the board by the means for removably receiving;
(c) support means attached to the game board for permitting the game board to be variously disposed; and
(d) a ring to be tossed at the board for retention by the peg during the playing of a ring toss game, the frame of the game board comprising a hollow container provided with an apertured interior cavity and an opening permitting access to the cavity, the peg and ring being selectively storable in the cavity, and a double-wall means partially surrounding and forming the interior cavity and an airtight chamber within the frame for permitting the frame to float in a liquid body, the frame being formed by two spaced, substantially parallel, planar faces and a side wall extending between and around the periphery of the faces for substantially enclosing a space between the faces, the space between the faces including the cavity and chamber, the opening permitting access to the cavity being formed in the side wall, with the side wall portion extending away from the opening being the double-wall means forming the airtight chamber in cooperation with the faces of the frame.

4,120,500

LIGHT IMAGE TARGET WITH ELEVATING AND ROTATING PROJECTOR

Benedict Montanarello, 35 Odell Ave., Apt. 2C, Yonkers, N.Y. 10701

Filed Jan. 5, 1977, Ser. No. 756,870
Int. Cl.[2] A63B 65/02; F41B 7/08
U.S. Cl. 273—101 **2 Claims**



1. Space flight game apparatus comprising a light source in combination with indicia, said indicia being positioned in between said light source and a planar surface, said light source and indicia being pivotally mounted for casting said light image at any one of a plurality of positions on a planar surface, at least one launching tube mounted on a platform extending from a base having propelling means operatively associated therewith, said propelling means arranged to deliver an accelerating force to a projectile, trigger means for releasing an accelerating force from said propelling means, said platform being rotatable in a horizontal plane about a pivot extending therefrom, said platform being rotated through a rotatable wheel operatively associated with said platform, said rotatable wheel having a cord secured thereto at one end, said pivot about which said platform is rotatable comprising an axle substantially transverse to said platform, the other end of said cord being wound around and secured to said axle, resilient means operatively associated with said platform for applying a return torque to said platform when said platform is rotated, whereby rotation of said wheel causes said axle and platform to rotate, said platform being raised and lowered through crank means operatively associated with said platform for raising and lowering said platform, said rotatable wheel and said crank means being arranged so that said launching tube can be aligned to fire a projectile at a light image cast by said light source in combination with indicia at any of said plurality of positions on a planar surface.

4,120,501

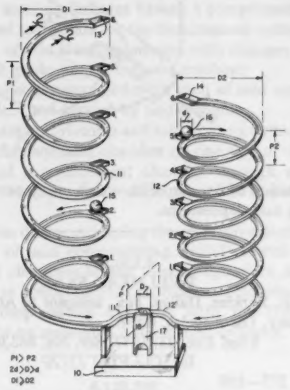
INCLINED TRACK BALL AND DICE GAME

Roger Lee Atherton, 5328 Larkspur St., Ventura, Calif. 93001

Filed Sep. 29, 1977, Ser. No. 837,928

Int. Cl.[2] A63F *7/02*

U.S. Cl. 273—120 R **6 Claims**



1. An inclined track ball and dice game including, in combination:

(a) a frame structure defining first and second inclined tracks disposed in spaced positions and each having numbered levels, means on each level defining a numbered starting position, the lowest ends of said tracks extending towards each other along upwardly sloped path portions to meet at a common point at the highest point of said path portions, said point being below the levels of the lowest numbered levels of said tracks;

(b) a pair of dice,

(c) two balls dimensioned to be supported by said tracks respectively so that when placed at a starting position corresponding to a number on said dice and released, they will roll down the tracks by gravity;

whereby a person can throw the dice and thereafter position said balls on specifically numbered levels of the tracks determined by the numbers showing on the dice, respectively, the person then releasing the highest level ball and after a given time interval the other ball, said person attempting to evaluate said given time interval so that said balls will meet at said highest point of said sloped path portions and rebound back to come to rest at the lowest points of the inclined tracks upon which they were respectively initially positioned.

4,120,502

GOLF GAME APPARATUS

William H. Martin, Guelph, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

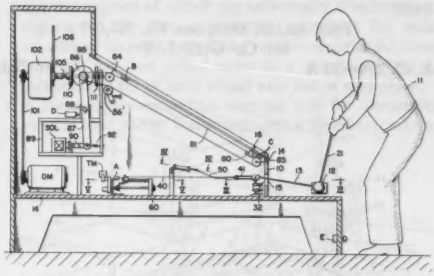
Filed Jul. 18, 1977, Ser. No. 816,647

Int. Cl.[2] A63B *69/36*

U.S. Cl. 273—176 R **4 Claims**

1. An apparatus for simulating the play of gold comprising a display unit on which an indicator is mounted to travel from a start position to a finish position and a drive unit which incorporates a captive ball mounted to the apparatus together with electro-mechanical means to cause the indicator to travel a distance related to the impact force with which the captive ball is struck,

said electro-mechanical means including first electro-mechanical means to translate the impact force against the captive golf ball into a measured time period which is proportioned to said impact force and a second electro-



mechanical means to drive the indicator for the duration of said time period.

4,120,503

CHASE-TYPE BOARD GAME

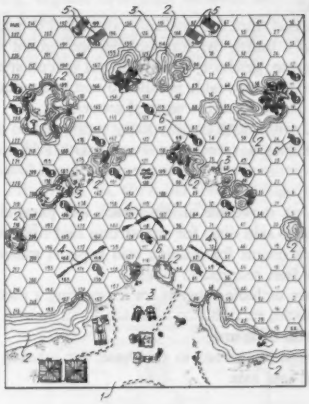
Richard Brabazon Macrory, and Nicholas Gordon Young, both of 68 Stockwell Park Rd., London, S.W. 9, England

Filed Jan. 26, 1977, Ser. No. 762,924

Claims priority, application United Kingdom, Feb. 3, 1976, 4195/76

Int. Cl.[2] A63F *3/00*

U.S. Cl. 273—244 **3 Claims**



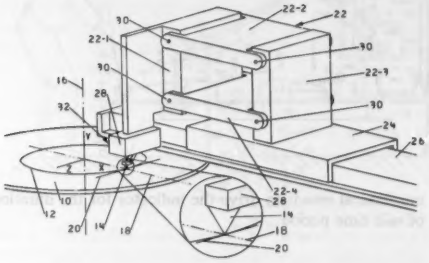
3. A game comprising a plurality of playing pieces each in the form of a model swimmer having removable legs, a different playing piece in the form of a shark, a playing surface divided into at least two areas one area representative of sea and the other area representative of land, a plurality of playing spaces on that part of the playing surface representative of sea, each playing space being individually identifiable by a different character reference and a plurality of different chance instructions adversely affecting a player's progress in a game, a plurality of different chance instructions favorably affecting a player's progress in a game, said chance instructions being carried on chance cards, and dice means for determining whether a player follows either an adverse chance instruction or a favorable chance instruction.

4,120,504

DISK TRACKING AND SUPPORT APPARATUS

William Buttfield Brecht, 114 Bloomingdale Ave., Wayne, Pa. 19087

Filed Jul. 20, 1976, Ser. No. 707,057
Int. Cl.[2] G11B *3/10*
U.S. Cl. 274—23 A **41 Claims**



1. Apparatus for rotating a disk and causing a stylus to track a groove signal therein along a line radial to said disk, comprising:

(a) a stylus;

(b) a stylus holder;

(c) a four bar linkage, moveable parallel to said radial line in response to stylus vertical movement, all four bars coplanar, said stylus holder secured to a first bar thereof, said four bar linkage comprising:

(i) a first bar generally perpendicular to said disk, moveable vertically unitarily with said stylus holder;

(ii) a second bar pivotally connected to said first bar and to a third bar for coplanar movement with respect thereto, rotatable in response to vertical movement of said first bar;

(iii) a said third bar pivotally connected to said second bar and a fourth bar for coplanar movement with respect thereto, generally parallel to yet spaced apart from said first bar, moveable parallel to said line radial said disk in response to stylus vertical movement;

(iv) a said fourth bar pivotally connected to said first and third bars, rotatable unitarily with said second bar in response to vertical movement of said first bar and said stylus;

(d) means, moveable along a track line parallel to said line radial to said disk, for supporting said four bar linkage;

(e) track means for guiding said support means along said track line, secured to a base;

(f) a base including means for supporting a platter;

(g) a platter, rotatable on said base about an axis, for supporting said disk; and

(h) means, connected to said base, for rotating said platter about said axis.

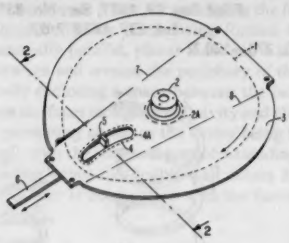
4,120,505

STABILIZING BACKING PLATE FOR A FLEXIBLE DISK STORE

Allen Ronald Cox; Michael Robert Hatchett, and Leonard John Rigbey, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 13, 1977, Ser. No. 815,394
Int. Cl.[2] G11B *3/60*
U.S. Cl. 274—39 R **11 Claims**

1. For use in a recording and/or reproducing apparatus wherein a record disc rotates over a stationary backing plate, the improvement being a stabilizing backing plate on which a bearing surface is provided, a face of the plate provided with a plurality of spaced depressions distributed over the face in a regular grid pattern and separated by portions of untreated plate whereby air entrapped in said depressions enhances start-up of rotation of a record disk which is adjacent said plate and covering said depressions.

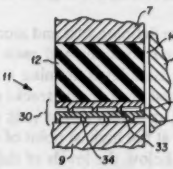


4,120,506

WELLHEAD SEAL

Thomas K. Perkins, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 21, 1977, Ser. No. 863,005
Int. Cl.[2] F16J *15/20*
U.S. Cl. 277—105 **5 Claims**



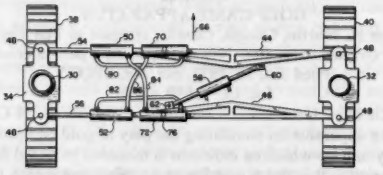
1. In a wellhead having an elastic annular seal means, the improvement comprising at least one annular resilient back-up means adjacent said seal means, said backup means comprising a stack of at least two annular resilient members, each member having a plurality of spaced apart protrusions thereon, said members being oriented in relation to one another so that the protrusions of each member abut the adjacent member in between the protrusions of that adjacent member.

4,120,507

COMPENSATED EXTENDABLE STEERING MEANS FOR HEAVY MACHINES

Charles P. Miller, McHenry, Ill., assignor to Miller Formless Co. Inc., McHenry, Ill.

Filed Mar. 16, 1977, Ser. No. 778,122
Int. Cl.[2] B62D *11/22*
U.S. Cl. 280—6 R **3 Claims**



1. A mobile construction machine including:

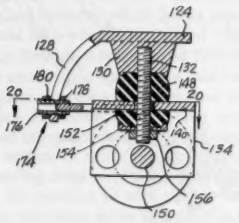
a main frame;

a pair of vertically adjustable support means affixed to opposite sides of said main frame;

ground engagement means disposed from said adjustable support means;

each of said ground engagement means being connected to said support means through a vertical steering axis;
a pair of transverse steering linkages connecting between said ground engagement means fore and aft of said vertical pivot axes;
means to actuate said steering linkages and turn said ground engagement means in unison;
each of said steering linkages having a compensating cylinder adapted to provide for the simultaneous extension and retraction of said steering linkages with changes in elevation of the grade supporting said machine;
a floating cylinder associated with each of said compensating cylinders and carried by said machine;
said compensating cylinders and said floating cylinders each having a displacement chamber on one side of the piston therein and a replacement chamber through which its piston rod extends on the other side of its respective piston;
conduit means cross-connecting the respective displacement chambers of said compensating cylinders with the displacement chambers of said floating cylinders; and
conduit means connecting the replacement chamber of each of said compensating cylinders with the replacement chamber of its associated said floating cylinder.

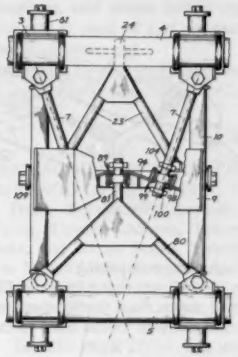
4,120,508
WHEELED SKATEBOARDS
John Steven Brown, 1141 Humbolt St., and Thomas Gerald Hillard, 1628 4th St., both of Santa Rosa, Calif. 95404
Filed Mar. 30, 1977, Ser. No. 782,916
Int. Cl.[2] A63C *17/02*
U.S. Cl. 280—11.28 **14 Claims**



6. An adjustable truck for supporting a pair of wheels which are connected to an axle, said truck adapted to be mounted to the underside of a board, which comprises:
first means for rotatably supporting said axle about a first, substantially vertical pivot axis;
second means coupled to said axle for rotatably supporting same about a second pivot axis which is inclined with respect to said first pivot axis;
third means adapted to be mounted to the underside of said board for supporting said first and second means; and
fourth means coupled to said second and third means for adjusting the angle of inclination of said second pivot axis whereby the turning radius of said wheels may be selectively adjusted.

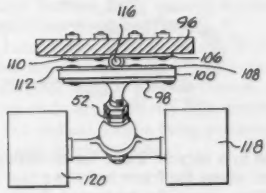
4,120,509
SELF-STEERING TANDEM AXLE BOGIE
Richard James Reeve, 5505 E. Evergreen, Apt. 306, Vancouver, Wash. 98661, and Dennis Raymond Shirley, 14670 NE. Russell Ct., Portland, Oreg. 97320
Filed Apr. 22, 1977, Ser. No. 789,883
Int. Cl.[2] B62D *13/00*
U.S. Cl. 280—81 A **7 Claims**

1. A self-steering tandem axle bogie for a vehicle comprising:
a. a pair of longitudinally extending frame supporting members;
b. front and rear transversely extending wheel axles, opposite end regions of which are universally attached to end regions of the frame supporting members for sliding movement thereon, permitting relative angular movement between the two wheel axles in a common plane and independent tilt of each wheel axle out of said plane;
c. a transversely extending steering unit for transmitting vehicle load to the frame supporting members, said unit



being universally attached at opposite ends to the frame supporting members and longitudinally spaced between said front and rear axles; and
d. a pair of steering arms, each arm coupling one of the end regions of said front axle to the corresponding transverse side of said steering unit by pivotal joining means at each end of said arm, for transmitting, upon vehicle turning occurring, angular movement between said steering unit and said frame supporting members to said front axle to effect angular movement of said front axle, relative to said rear axle, in the direction of vehicle turn.

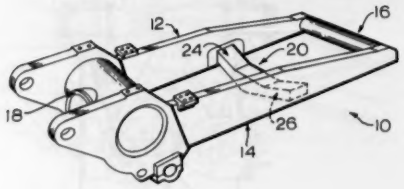
4,120,510
WHEELED SKATEBOARDS
Thomas Gerald Hillard, Santa Rosa, Calif., assignor to John S. Brown, Santa Rosa, Calif., a part interest
Filed Mar. 30, 1977, Ser. No. 782,915
Int. Cl.[2] A63C *17/02*
U.S. Cl. 280—87.04 A **8 Claims**



1. Apparatus, which comprises:
a first substantially planar support member adapted to support a rider on the upper surface thereof;
a second substantially planar support member positioned underneath said first support member;
wheeled truck means connected to the underside of said second support member for turning to the left or right in response to the tilting of said second support member respectively to the left or right about its longitudinal axis; and
means operatively connecting said first and second support

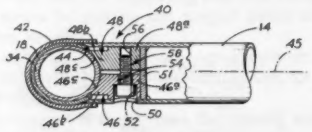
members for preventing said truck from turning until said first support member is tilted a predetermined amount.

4,120,511
SADDLE/MAIN FRAME FABRICATION
Royce D. Allen, East Peoria, and Rollen G. Easter, Tremont, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Feb. 4, 1977, Ser. No. 765,517
Int. Cl.[2] B62D *21/00*
U.S. Cl. 280—795 **8 Claims**



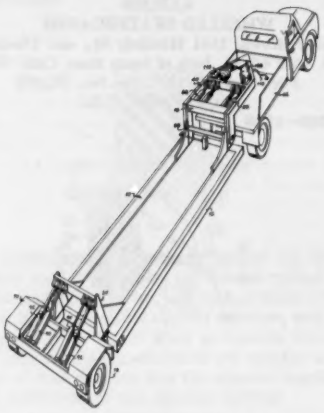
1. Frame structure comprising:
first beam means comprising upper and lower members,
first sidewall means fixed to the upper and lower members, and second sidewall means fixed to the upper and lower members; and
second beam means defining an end portion positioned in an opening defined by the second sidewall means and one of the upper and lower members, and fixed to the second sidewall means;
wherein the end portion comprises an end plate positioned substantially coplanar with the second sidewall means; and
first and second reinforcing members respectively extending between and fixed to the upper and lower members, and a third reinforcing member extending between and fixed to the first and second reinforcing members in the area of the opening.

4,120,512
SADDLE PILLAR CLAMP FOR BICYCLE
Lawrence A. Newlands, 2371 SW. Cedar, Portland, Oreg. 97205
Filed Jan. 14, 1977, Ser. No. 759,389
Int. Cl.[2] B62K *19/36*
U.S. Cl. 280—281 R **6 Claims**



1. Means in a bicycle frame for mounting the pillar of a bicycle seat, where the frame includes a first elongated, cylindrical, hollow, generally horizontal frame member, and a second elongated, cylindrical, hollow, generally upright frame member, with said first frame member having one end joined adjacent the upper end of said second frame member, and with said second frame member including an open top defined by a continuous generally circular wall expanse adapted freely to receive such a pillar within the member with the pillar extending downwardly past the region of joinder of said two frame members, said mounting means comprising
means defining an opening in said second frame member exposing to the interior thereof the interior of said first frame member,
a first concealed clamping member disposed within said first frame member adjacent said opening and including a clamping face exposed to the interior of said second frame member and clampingly engageable with a seat pillar received within said second frame member,
a second concealed clamping member disposed within said first frame member adjacent, and movable relatively toward and away from, said first clamping member, said second clamping member also having a clamping face exposed to the interior of said second frame member clampingly engageable with a seat pillar received within said second frame member in cooperation with said clamping face on said first clamping member, and
actuating means operatively connected to said clamping members, accessible and operable from outside said frame for shifting said members relatively toward and away from each other without effecting any configuration change in said upper end of said second frame member.

4,120,513
IMPLEMENT TRAILER
Henry Wayne Hurt, Lubbock, Tex., assignor to Lubbock Manufacturing Company, Lubbock, Tex.
Filed Aug. 4, 1977, Ser. No. 821,594
Int. Cl.[2] B62D *53/06*
U.S. Cl. 280—423 B **16 Claims**

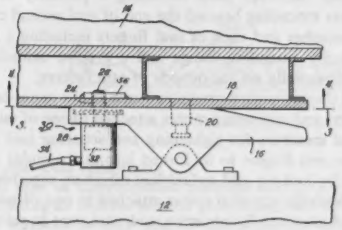


1. In a trailer having
a frame with
(i) a longitudinal axis,
(ii) a gooseneck connected to
(iii) a front end of a main bed, and
(iv) a rear member connected to
(v) a rear end of said main bed,
at least two ground engaging wheels connected to the frame,
universal means for attaching the gooseneck to a towing vehicle; the improved structure comprising in combination with the above:
a. the front end of the main bed being connected to the gooseneck by front pivots,
b. front motor means interconnecting the gooseneck and the main bed for pivoting said gooseneck relative to said main bed about the front pivots, and
c. front locking means for maintaining the gooseneck in a fixed position in relationship to said main bed, said front locking means including
d. at least one hollow cylinder,
e. a longitudinal rod slidably fitting within the hollow cylinder, and
f. a locking pin in correlated holes in the hollow cylinder and rod.

4,120,514
SAFETY DEVICE FOR TRACTOR-TRAILERS TO PREVENT JACKKNIFING

O'Neal Sanders, 7544 South Essex, Chicago, Ill. 60649

Filed Jun. 10, 1977, Ser. No. 805,322
Int. Cl.[2] B62D 53/08
U.S. Cl. 280—432 10 Claims

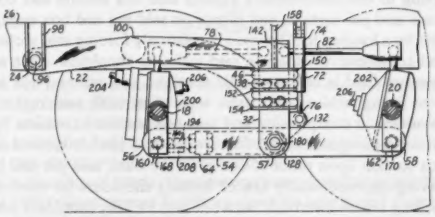


1. In a tractor-trailer rig which comprises a tractor having a fifth-wheel coupler and a semi-trailer having a complementary coupler comprising a wear plate and a coupling pin projecting downwardly from said wear plate and providing, when the rig is coupled, an axis about which the rig is articulated with the angle of articulation being sufficiently large to permit maneuvering of the semi-trailer as needed, with the undesirable consequence that jackknifing can occur under certain circumstances, and adjustable means adjustable from an inoperative position to an operative position, said adjustable means in the operative postion limiting the angle of articulation sufficiently to eliminate or to minimize the danger of jackknifing, the combination therewith in which said adjustable means comprises a pressure fluid cylinder which has its top affixed to the undersurface of said fifth-wheel coupler and which is adapted to project a pin up through a bore in said fifth-wheel coupler and then through an enlarged aperture in said wear plate, said pressure fluid cylinder having a collar integral with the top of said cylinder which surrounds said pin and projects up into said bore in a close complementary fit to a point near but not above the upper surface of said fifth-wheel coupler, said enlarged aperture having stops circumferentially displaced from said pin, so that the rotation of said tractor relative to said trailer is limited by said stops when said pin is in the projected position, whereby the thrust on said pin, resulting from it engaging one of said stops, is transferred to said fifth-wheel coupler through said collar.

4,120,515
SUSPENSION SYSTEM FOR TANDEM AXLE VEHICLES

David S. Vinton, Morton, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 15, 1977, Ser. No. 787,816
Int. Cl.[2] B60G 5/02
U.S. Cl. 280—678 6 Claims



1. A suspension system for tandem axle vehicles including a vehicle frame, comprising:

a first anti-roll member having a first end and being pivotally connected at the first end to one portion of the vehicle frame;

a second anti-roll member having a first end and being spaced from the first anti-roll member and pivotally connected at the first end to another portion of the vehicle frame;

a crossbeam member having opposite ends and being rigidly connected at each of said opposite ends to a respective second end of the spaced anti-roll members;

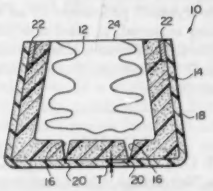
torque tube means for limiting relative movement between the anti-roll members, said means having opposed ends and being connected at each of said opposed ends to a respective anti-roll member; and

resilient suspension means for resiliently interconnecting the frame portions and the crossbeam member.

4,120,516
COVER MEMBER FOR A SAFETY AIR-CUSHION DEVICE AND A METHOD OF PRODUCING THE SAME

Yukio Takamatsu, Ikeda; Takashi Wakabayashi, Toyonaka; Hideyo Noda, Kyoto; Kiyoshi Ichikawa, Tokyo; Tsuneteru Kamegai, Yokosuka, and Kazuo Ikawa, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Dec. 2, 1976, Ser. No. 746,713
Claims priority, application Japan, Dec. 5, 1975, 50-162886[U]
Int. Cl.[2] B60R 21/10
U.S. Cl. 280—728 4 Claims



1. A cover member for substantially covering an expansible air-cushion in a dormant condition, said expansible air-cushion being expanded to break said cover member and thus to get out from said cover member to protect an occupant of a vehicle at a vehicle collision, said cover member comprising:

a bag-shaped inner laminate arranged to substantially cover up said expansible air-cushion in a dormant condition and having at least one slit extending through said inner laminate, said inner laminate being made of a relatively low density polyurethane foam; and

a bag-shaped outer laminate arranged to cover the outer surface of said inner laminate and having at least one cut portion at its inner surface portion thereof, said outer laminate being made of a relatively high density polyurethane foam and said cut portion being positioned to open to said slit of said inner laminate.

4,120,517
REMOVABLE PLASTIC BINDING

Henry N. Staats, Deerfield, Ill., assignor to General Binding Corporation, Northbrook, Ill.

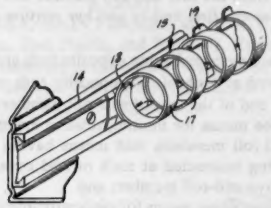
Filed Jun. 21, 1977, Ser. No. 808,556
Int. Cl.[2] B42D 1/06
U.S. Cl. 281—19 R 11 Claims

1. A removable binding system for attachment to a cover to retain paper sheets thereto, comprising:

a channel member mountable on the cover; and

a removable binding having a base portion and a plurality of paper sheet retaining loops formed of curled finger-like strips extending from the base portion, a retaining means

extending from longitudinal sides of the base portion being provided for engagement in said channel member, said



base portion, finger-like strips, and retaining means being formed from a single sheet of material.

4,120,518

CARBONLESS COPYING PAPERS

Günther Baatz, Cologne; Manfred Dahm, Leverkusen, and Kurt Triebeneck, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Apr. 19, 1977, Ser. No. 788,771

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1976, 2617747

Int. Cl.[2] B41M *5/22*

U.S. Cl. 282—27.5 **5 Claims**

1. A paper sheet containing a donor layer comprising a plurality of microcapsules containing, as core material, a solution of at least one dyestuff precursor in an organic solvent and, as encapsulating material, at least one polycarbodiimide which contains a plurality of units of the formula —R—N=C-=N—R— wherein R is alkylene, cycloalkylene, arylene or a substitution product thereof.

4,120,519

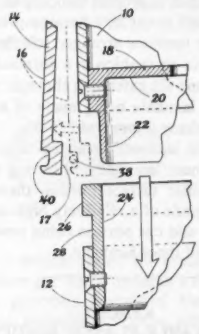
COLLET TYPE CYLINDER SEPARATION DEVICE

Robert M. Bridges, Northridge, Calif., assignor to The Bendix Corporation, North Hollywood, Calif.

Filed Oct. 3, 1977, Ser. No. 838,604

Int. Cl.[2] F16L *37/08*

U.S. Cl. 285—3 **7 Claims**



1. Apparatus for fastening together a pair of cylindrical members having substantially the same diameter comprising

a first annular member fastened to the inside surface near the end of one of said cylindrical members having a small flange extending radially outwardly to approximately the outside diameter of said cylindrical member, said flange being spaced from the end of said cylindrical member and cooperating therewith to define an annular groove;

a second annular member fastened to the inside surface of the adjoining end of the second of said cylindrical members, said second annular member including an axially extending flange of diameter just less than the inside diameter of said first annular member thereby permitting said first and second annular members to telescope together, said second annular member also including an inwardly extending radial flange;

a plurality of circumferentially spaced arcuate members fastened to the outside of said cylindrical member, said arcuate members each including a plurality of spring fingers extending beyond the end of said second cylindrical member and each of said fingers including a radially inwardly extending flange and a groove extending circumferentially on the outside of said fingers;

a small diameter wire rope positioned in the grooves of said fingers and tensioning means attached to one of said cylindrical members for tightening and securing said rope to cause said fingers to be forced into said annular groove, thereby locking said cylindrical members together; and

an explosively actuated cutter attached to one of said cylindrical members for severing said wire rope to release said cylindrical members from each other.

4,120,520

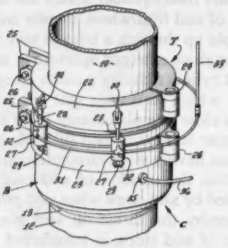
LOCKABLE RIGID CONNECTOR FOR PIPE AND METHOD OF MAKING THE SAME

Arthur G. Ahlstone, Ventura, Calif., assignor to Vetco, Inc., Ventura, Calif.

Filed May 4, 1977, Ser. No. 793,525

Int. Cl.[2] F16L *35/00*

U.S. Cl. 285—18 **19 Claims**



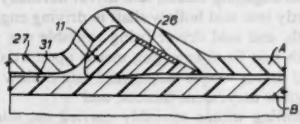
1. A lockable rigid pipe connector comprising: a pin and a box; said pin having an externally tapered section and a transverse make up shoulder; said box having an internally tapered body section to receive the tapered section of said pin and having an inner transverse make up shoulder confronting said pin make up shoulder; said pin section and said box section having therebetween axially spaced companion tapered sealing portions; said box section having port means between said sealing portions for admission therebetween of a pressure fluid acting to circumferentially expand said box section and compress said pin section; and means on said pin and box engageable by a loading tool for axially relatively forcing said sections and compressively loading said make up shoulders while said pressure fluid is acting on said sections; said pin and box sections being held against axial separation with said make up shoulders in compression and said box section in tension by a pressure energized shrink fit between said pin section and said box section upon relief of said pressure fluid; said pin and box having opposed axially spaced locking shoulders for receiving locking means insertable between said locking shoulders while said make up shoulders are under compression and said box is in tension and one of said pin and box having access means enabling insertion of said locking means between said locking shoulders.

4,120,521

COMBINED MOULD ELEMENT AND SEALING RING

Gunnar Parmann, Alvøy, Norway, assignor to Rieber & Son Plastic-Industri A/S, Bergen, Norway

Division of Ser. No. 608,758, Aug. 28, 1975, Pat. No. 4,030,872.
This application Jan. 21, 1977, Ser. No. 760,958
Int. Cl.[2] F16L *55/00*
U.S. Cl. 285—113 6 Claims



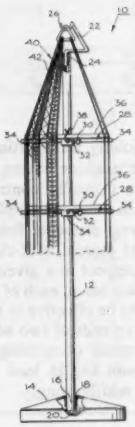
1. A pipe joint comprising
a first pipe of thermoplastic material having a socket end including an internal annular groove and internal cylindrical surfaces on each side of said groove of substantially equal diameter;
a second pipe having an insert end within said socket end; and
a sealing ring disposed in said groove wholly between said cylindrical surfaces concentrically between and sealingly engaging said insert end and said socket end, said ring being a unitary ring composed of a body of elastically yielding material and a rigid circumferentially continuous annular ring member within said body, said ring member having an outer diameter greater than said diameter of said internal cylindrical surfaces.

4,120,522

MACRAME-FORMING DEVICE

Patricia A. Rodnunsky, 17810 Simonds St., Granada Hills, Calif. 91344

Filed Apr. 4, 1977, Ser. No. 784,057
Int. Cl.[2] D04G *5/00*
U.S. Cl. 289—18 12 Claims



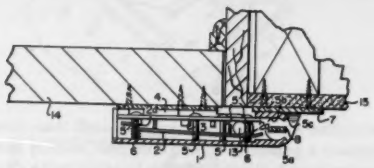
1. An improved macrame-forming device, said device comprising, in combination:
a. an elongated center pole;
b. a support base secured to and maintaining said pole in an upright generally vertical position;
c. a plurality of frame support members releasably secured to said pole at spaced locations along its length and extending outwardly therefrom;
d. A plurality of frames supported by said frame support members; and
e. a macrame material-holding bracket secured to said pole above said support members and adjacent the upper end of said pole.

4,120,523

SAFETY FASTENING

D. Jose Antonio Navarro Fayos, Valencia, Spain, assignor to Montajes Electronicos Dorcas S.A., Siete Aguas, Spain

Filed Jul. 25, 1977, Ser. No. 818,543
Claims priority, application Spain, Jan. 26, 1977, 225.949
Int. Cl.[2] E05C *17/16*
U.S. Cl. 292—268 9 Claims



1. An opening controller device for a door or the like comprising:
an elongated latch means of a given size and a catch means, said latch and said catch means adapted for mounting adjacent each other, one on the door and the other on a support opposite at least one side of the door,
said catch means including a catch member having first and second sides, said first side being of a larger dimension than said second side,
said latch means having an end formed with an opening and a mouth providing entry to and exit from said opening, said opening being of a size to accept the entry of the second side of the catch member but to prohibit withdrawal of the latch means from said catch member when said first side of the catch member is presented to the exit of said opening,
and means for slidably and pivotally mounting said latch means relative to said catch member and to the member on which it is mounted, said mounting means permitting said opening at the end of said latch means to have the catch member accepted therein when the latch means is slidably moved to said catch member with the second side thereof presented to the mouth of the opening and to permit pivoting of the latch means relative to said catch member when the door is pivoted open relative to the support means so that the catch member is prevented from leaving said opening by the first side of the catch member being presented to the exit of the opening.

4,120,524

DEVICE FOR OPENING, CLOSING AND LATCHING A VENT CLOSURE MEMBER

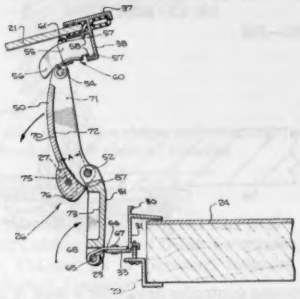
Elwood W. Buck, Jr., Pasadena, Calif., assignor to D G Shelter Products Company, City of Industry, Calif.

Filed Jul. 7, 1977, Ser. No. 813,502
Int. Cl.[2] E05C *17/34*
U.S. Cl. 292—263 7 Claims

1. In a means for opening, closing, and latching a closure member hinged at one side of an opening defined by a frame provided in a wall, the combination of:
an upper latch member having one end provided with a pivotal connection to said closure member;
a lower latch member having one end provided with a pivotal connection to said frame; the other ends of said latch members being pivotally interconnected together; the pivotal connection of the lower latch member to said frame having a pivotal axis adjacent the plane of the frame opening;
and actuating means connected to said upper latch member

the said pivotal connection of said latch members to said closure and to said frame being at the side of said opening opposite to said hinged connection of said closure member to said frame;

the pivotal interconnections of the other ends of said latch members lying beneath the framed opening when the closure member is closed and the latch members are collapsed and in nested relation;



said pivotal connections providing pivotal axes having a toggle relationship in closed position of said closure member;

and means to adjust clearance of said nested latch members with respect to the interior surface of said wall, said adjustment means including

a bolt carried by said closure members;

and a connecting block threaded on said bolt and providing a pivotal connection for said upper latch member.

4,120,525

LATCH ASSEMBLY

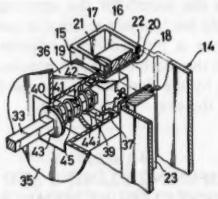
Tetsuro Kagoura, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Mar. 29, 1977, Ser. No. 782,507

Claims priority, application Japan, Mar. 3, 1976, 51/41104[U]

Int. Cl.[2] E05C *13/00*

U.S. Cl. 292—336.3 **9 Claims**



1. A latch assembly for use on a closure frame member, said latch assembly comprising:

(a) a support frame having attachment means adapted to be attached to the closure frame member;

(b) a hollow shaft mounted in said support frame and rotatable about a longitudinal axis thereof;

(c) a latch bolt fixed at one end thereof to said hollow shaft and extending radially from said hollow shaft, said latch bolt being angularly movable about said axis between a first position in which said bolt is retracted within said support frame and a second position in which said bolt has the opposite end projecting outwardly from said support frame;

(d) a casing adapted to be attached to the closure member, said casing having a bore and having fixed engagement means;

(e) a handle having a further shaft disposed in and rotatably supported by said bore in an axially fixed position;

(f) a driver torque bar having its outer end mounted coaxially in said handle-shaft and corotatable therewith and axially freely movable therein, said driver torque bar having an enlarged driver on its inner end, said driver being normally held in an angularly fixed position in response to said driver's being engaged partly with said fixed engaging means, said driver normally also extending partly into said hollow shaft in driving engagement therewith, and said driver being shiftable out of engagement with said fixed engaging means upon axial movement of said driver torque bar toward said hollow shaft to enable angular movement thereof; and

(g) shifting means movably carried on said axially fixed handle for shifting said driver torque bar axially toward said hollow shaft.

4,120,526

APPARATUS FOR TRANSPORTING COIL CORES

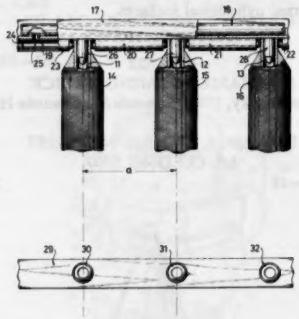
Joachim Rohner, Mönchen-Gladbach, Germany, assignor to W. Schlafhorst & Co., Mönchen-Gladbach, Germany

Filed Nov. 16, 1976, Ser. No. 742,110

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1975, 2551679

Int. Cl.[2] B66C *1/46*; D01H *9/08*

U.S. Cl. 294—87 R **12 Claims**



1. Apparatus for jointly transporting wound or unwound coil cores of a textile machine having a multiplicity of work stations comprising a centrally controllable beam disposed alongside the textile machine, a multiplicity of engageable and disengageable clamping elements fastened to said beam in direction of alignment thereof, said clamping elements being disposed offset with respect to a given mutual spacing of the work stations along said beam, each of said clamping elements being disposed so as to be effective in two opposite directions for engaging respective ends of two adjacent coil cores, each of said clamping elements comprising an elongated housing connected to said beam and at least one clamping member movably mounted in said housing.

4,120,527

CAB DESIGN

Dean M. Lawrence, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 15, 1977, Ser. No. 787,811

Int. Cl.[2] B62D *33/06*

U.S. Cl. 296—28 C **15 Claims**

1. In a vehicle cab structure defining an operator compartment, an improved air circulating means comprising:

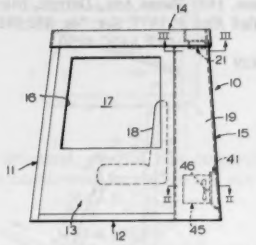
a pair of parallel, spaced hollow uprights defining upright rear corners of the cab structure;

an upper hollow horizontal wall having air flow communi-

cation at its opposite ends with an upper portion of said hollow uprights;

a lower hollow horizontal wall having air flow communication at its opposite ends with a lower portion of said hollow uprights;

first passage means carried by said upper wall for providing air flow communication between said compartment and said hollow upper wall;



second passage means carried by said lower wall for providing air flow communication between said compartment and said hollow lower wall; and

air flow means for causing air to be circulated in a flow path through said horizontal hollow walls, upright cab structure corners, and compartment.

4,120,528

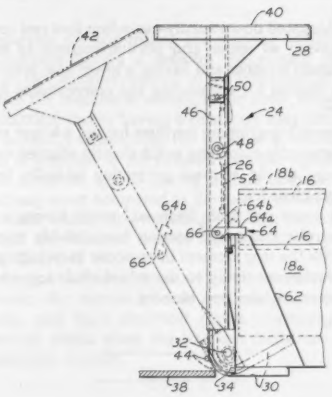
LATCH FOR OVERHEAD GUARDS ON INDUSTRIAL VEHICLES

Frank R. Samide, Chardon, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Jul. 18, 1977, Ser. No. 816,832

Int. Cl.² B60J 7/24

U.S. Cl. 296—107 **5 Claims**



1. An industrial vehicle, comprising:

a weighted member removably mounted in the vehicle;

an overhead guard mounted on the vehicle and pivotally controlled between first and second positions by mounting and removing the weighted member, respectively; and

means for latching and unlatching the guard, said means being movable under the influence of gravity to latch the guard in the first position when the weighted member is positioned in the vehicle and being movable by the weighted member to unlatch the guard as the weighted member is removed from the vehicle.

4,120,529

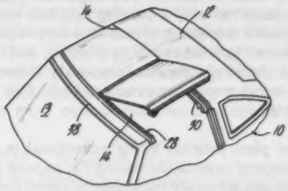
REMOVABLE ROOF PANELS FOR VEHICLES

Richard R. Chrysler, Brighton, Mich., assignor to Cars & Concepts, Inc., Brighton, Mich.

Filed Dec. 30, 1976, Ser. No. 755,665

Int. Cl.² B60J 7/08

U.S. Cl. 296—137 B **8 Claims**



1. A roof panel assembly for vehicles having a vehicle body with a roof portion, said roof portion including a windshield header with a first marginal edge rearwardly thereof extending from one side of said body to the other, a roof panel having a second marginal edge spaced rearwardly from said windshield header and extending from one side of said body to the other, a central frame member having opposed ends attached to said first and second marginal edges and disposed on the longitudinal center line of said body, a pair of seal members at opposite sides of said central frame member and mounted on said marginal edges and said central frame member, a pair of panel members detachably supported at opposite sides of said central frame member for engagement with said pair of seal members, first and second frame members extend transversely from one side of said body to the other and being attached to said first and second marginal edges, respectively, and in which said central frame member is attached to said first and second frame members.

4,120,530

INVALID CHAIRS

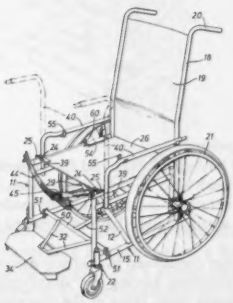
Michael Imbro, 62 Heathcote St., Sandford Hill, Longton, Stoke-on-Trent, England

Filed Apr. 27, 1977, Ser. No. 791,411

Claims priority, application United Kingdom, Apr. 30, 1976, 17784/76

Int. Cl.² A47C 1/02

U.S. Cl. 297—337 **16 Claims**



1. An assembly for assisting movement of an occupant in changing between sitting and standing postures in an invalid chair having a fixed frame structure, said assembly comprising:

(a) a movable seat member support means,

(b) first means movably mounting said seat member support means on said frame structure for movement between a

seating support position and a relatively displaced forward standing support position,

(c) said first movable mounting means being effective to permit forwards and upwards angular movement of said seat member support means from a substantially horizontal orientation in said seating support position to a substantially upright back-supporting orientation in said relatively displaced forwards standing support position,

(d) a movable foot rest structure having a foot plate member,

(e) second means movably mounting said foot rest structure for movement between a raised foot-supporting position and a lowered ground-engaging position, and

(f) mechanical linkage means operatively interconnecting said seat member support means and said foot rest structure to transmit pressure and motion from one to the other,

(g) said foot plate member being maintained in a substantially horizontal orientation during the angular movement of the foot rest structure between the raised foot supporting position and the lowered ground engaging position,

(h) hand grip support members detachably mounted to the chair frame structure for assisting and steadying the chair occupant when changing between sitting and standing postures,

(i) said seat member seat means being controllable by the chair occupant varying and controlling foot pressure applied to the foot rest structure through shifting and altering his weight distribution and mainipulating said hand grip support members,

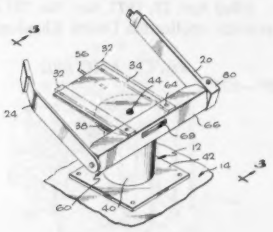
(j) said seat member support means being effective to move and exert supporting pressure against the body of the chair occupant to assist his movement in changing between a sitting posture in the chair and a standing posture on the foot rest structure.

4,120,531

VEHICLE CHAIR AND SEAT BELT ARRANGEMENT FOR CHAIR

Frank J. Fefferman, Burbank, Calif., assignor to Stylar Industries, Inc., Burbank, Calif.

Filed Dec. 6, 1976, Ser. No. 748,064
Int. Cl.[2] A62B *35/00*
U.S. Cl. 297—349 **4 Claims**



1. A chair comprising:

a chair pedestal having a lower end for mounting on a floor and an upper end with an outwardly-extending flange;

a seat assembly rotatably mounted on said pedestal to swivel thereon, said seat assembly having forward and rearward parts;

a coupling member connected to said seat assembly to swivel with it, said coupling having a pedestal-engageable portion with-opposite ends, lying at the rearward part of said seat assembly and extending under said flange, for engaging said pedestal to prevent forward movement of the coupling in an emergency; and

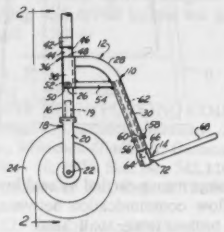
a seat belt assembly which includes a seat belt which can extend around the front of said seat sssembly to hold a person therein, said seat belt assembly having opposite mounting portions attached to locations on said coupling which lie at said opposite ends of said pedestal-engageable portion of said coupling, whereby to provide secure holding of the seat belt assembly.

4,120,532

SNAP-ON SWING-AWAY FOOT REST FOR WHEEL CHAIRS

Wayne N. Clanan, 1458 Burns Ave., Detroit, Mich. 48214

Filed Aug. 1, 1977, Ser. No. 820,695
Int. Cl.[2] A47C *7/50*
U.S. Cl. 297—429 **1 Claim**



1. A snap-on swing-away bracket for connecting a conventional wheel chair foot rest to a leg of a conventional wheel chair, said bracket comprising

an elongated hollow vertical wheel chair leg-attachment member having longitudinally-spaced lower and upper wheel chair leg-gripping portions of approximately U-shaped cross-section having oppositely-facing entrance openings of sufficient widths for the passage therethrough of said leg and having interior configurationa adapted to snugly engage said leg,

said leg-gripping portions having a gap therebetween also of sufficient width for the passage therethrough of said leg,

and an elongated downwardly-extending foot rest mounting arm having an upper arm portion secured to said leg-attachment member and having a lower arm portion with means therein for connecting the conventional foot rest thereto,

said lower leg-gripping portions having a lower end with an upwardly-extending notch therein adapted to fixedly engage a stop element projecting laterally from the wheel chair leg,

said lower end aside from said notch having a mainly annular transverse bearing face slidably engageable with the stop element in response to swinging of said bracket relatively to the wheel chair leg while supported by the stop element.

4,120,533

CANTILEVERED SUPPORTING SHELL FOR SEAT

Arthur J. Harder, Jr., Franklin Park, Ill., assignor to Coach and Car Equipment Corporation, Elk Grove Village, Ill.

Filed May 31, 1977, Ser. No. 801,842
Int. Cl.[2] A47C *1/12*
U.S. Cl. 297—451 **21 Claims**

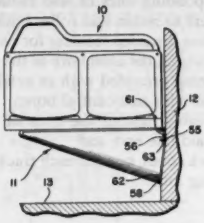
1. Structure for supporting a seat in cantilevered relation to a wall, said structure comprising:

a rigid, trough-shaped, structural, exterior skin;

said trough-shaped skin having an outer end and an open inner end;

means for mounting said inner end of said trough-shaped skin on said wall;

and means for mounting a seat atop said trough-shaped skin;



said rigid, structural, exterior skin comprising means for providing cantilevered support to said seat.

4,120,534

APPARATUS FOR CONTROLLING THE STEERING MECHANISM OF A MINING MACHINE

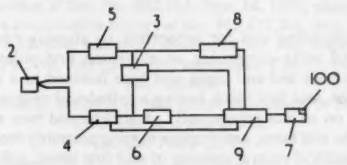
George Thomas Addison, Burton-on-Trent, England, assignor to Coal Industry (Patents) Limited, England

Filed Nov. 30, 1976, Ser. No. 746,003

Claims priority, application United Kingdom, Dec. 10, 1975, 50604/75

Int. Cl.[2] **E21C** *35/08*

U.S. Cl. 299—1 **7 Claims**



1. Apparatus for controlling the steering mechanism of a mining machine having a detector for sensing the cutting horizon of the machine relative to the boundary of a mineral seam when the machine is mining in the seam, comprising

first electrical means having a relatively long time constant for normally controlling the machine's steering mechanism in response to the detector's output signal,

second electrical means having a time constant which is relatively short compared to the time constant of said first electrical means for overriding said first electrical means should the detector output signal reach a preselected condition, and

third electrical means sensitive to a transient difference between the outputs of said first and second electrical means, said third electrical means overriding the first electrical means when the transient difference exceeds a preselected amount.

4,120,535

SCOOP-BELT MINER

Frank A. Delli-Gatti, Jr., Beckley, W. Va., assignor to Coaltex, Inc., Beckley, W. Va.

Filed May 6, 1977, Ser. No. 794,647

Int. Cl.[2] **E21C** *27/22, 35/20*

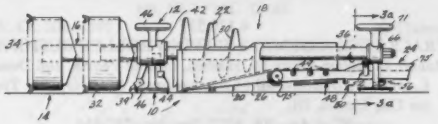
U.S. Cl. 299—18 **26 Claims**

1. A mining machine comprising

(a) a non-rotatable body member, with stabilizing means for insuring non-rotative movement of said body member in a bore,

(b) at least one rotatable pilot cutting head mounted in front of said non-rotatable body member, and means for rotating said cutting head including a rotatable shaft operatively connected to said cutting head,

(c) conveying means mounted behind said pilot head in operative association with said body member, for conveying material cut by said pilot head away from the cutting site, said conveying means comprising (i) scoop means disposed posteriorly of said cutting head and having a flat, leading bottom portion substantially abutting the bore floor and then extending posteriorly therefrom at a positive angle, and having side members that funnel toward each other, (ii) at least one auger section associated with said shaft for rotation of said pilot head, and located posteriorly of said pilot head and having a continuously de-



creasing diameter flight extending away from said pilot head, and disposed above said scoop means bottom portion for conveying cut material up said bottom portion, and (iii) a conveyor belt disposed posteriorly of said scoop means and extending to the bore mount, said scoop means bottom portion and side members funnelling toward said conveyor belt, and a top, transporting surface of said conveyor belt being disposed adjacent the termination of said scoop means bottom portion and side members, said at least one auger section terminating anteriorly of said conveyor belt, and

(d) said stabilizing means disposed between said at least one cutting head and said scoop.

4,120,536

WHEEL EQUIPPED WITH BRAKE, PARTICULARLY FOR MOTOR-CYCLES

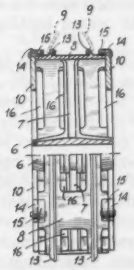
Dario Bernardi, Via Mazzini 5, Cattolica, (Prov Forli), Italy

Filed Aug. 26, 1975, Ser. No. 607,987

Claims priority, application Italy, Aug. 30, 1974, 44027 A/74

Int. Cl.[2] **B60T** *1/02*

U.S. Cl. 301—6 E **1 Claim**



1. A wire spoke wheel and brake assembly particularly for motorcycles, comprising in combination a hub member defining a wheel axis of rotation and a sleeve member coaxial and concentric therewith and circumferentially spaced therefrom, bracket members rigidly connecting said sleeve member with said hub member, said sleeve member having a cylindrical outer surface extending parallel to said wheel axis of rotation and including connecting means for connecting thereon wire spokes for the wheel rim, said wire spokes extending from said sleeve member on the side thereof remote from said hub member, said sleeve member having a lateral extension parallel to the wheel axis of rotation and lateral circumferential edges delimiting said lateral extension thereof, said bracket members

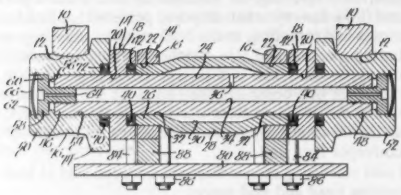
having at least near said sleeve member a thickness in the direction of said lateral extension smaller than said lateral extension of said sleeve member thereby to provide a free space between said lateral circumferential edges and said bracket members, at least one braking annular disc coaxial with said axis of rotation and extending in a plane perpendicular thereto, said annular braking disc being fixed to one of said lateral circumferential edges and having one annular portion thereof extending radially from said sleeve member towards said hub member, a braking element surrounding a portion of said braking disc at said annular portion thereof extending towards said hub member and wherein said sleeve member has apertures in said cylindrical surface thereof for the passage of cooling air therethrough.

4,120,537

TRACK LINK ASSEMBLY HAVING ROLLER BUSHINGS

Robert D. Roley; Glenn M. Haslett, both of Peoria, and Dennis L. Blunier, Danvers, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 15, 1977, Ser. No. 787,814
Int. Cl.[2] B62D 55/20
U.S. Cl. 305—14 **1 Claim**



1. In a track link assembly, the combination of:

a plurality of track links each formed of spaced apart elements and each having opposed ends, one of said ends being relatively wide and the other being relatively narrow, said ends being provided with track pin receiving bores, the narrow ends of said links being interposed between the wide ends of the next adjacent link with said track pin receiving bores in alignment;

a plurality of central bushings, one for each link, having reduced diameter ends received in the bores of the spaced apart elements forming each link at the relatively narrow end thereof, said central bushing having an expanded central interior;

annular seals carried by each spaced apart element forming each track link and disposed about the bores at the relatively wide ends thereof and in abutment with the reduced diameter ends of the corresponding central bushing;

a plurality of pins, each of greater length than the width of said relatively wide ends and extending through corresponding ones of said aligned bores and central bushings to pivotally interconnect adjacent ones of said links, each said track pin including a central bore opening to both ends of the pin and a radial conduit extending from said central cavity into fluid communication with said expanded central interior of said central bushing, the ends of each pin projecting from both sides of the relatively wide ends of each track link, said central bore being threaded at both of its ends;

a plurality of roller bushings, two for each track pin, each having an axial bore for receiving a corresponding end of one of said track pins, a radially inwardly directed shoulder within said bore intermediate its ends, a radially outwardly directed peripheral flange, and an annular seal receiving groove generally concentric with said axial bore and at one end of said axial bore;

annular seals within said grooves;

said roller bushings being disposed on corresponding ends of said track pins such that the annular seals in said annular grooves abut the adjacent sides of the corresponding track links;

headed, threaded fasteners in said axial bores and threaded into said central bores such that the heads of said fasteners engage corresponding ones of said radially inwardly directed shoulders to retain said roller bushings on said pin ends, at least one threaded fastener for each pin having its head recesses within the axial bore of the associated roller bushing and being provided with an axial conduit in fluid communication with said central bore;

snap caps removably closing the ends of said axial bores remote from said one end; and

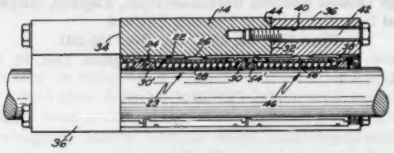
a plurality of track shoes, one for each track link, secured to a corresponding link.

4,120,538

PILLOW BLOCK INCLUDING PLURALITY OF SELF-ALIGNING LINEAR MOTION BEARINGS

William E. Headen, East Greenwich, R.I., assignor to Brown & Sharpe Manufacturing Company, North Kingstown, R.I.

Filed Mar. 24, 1977, Ser. No. 780,772
Int. Cl.[2] F16C 29/02
U.S. Cl. 308—6 C **3 Claims**



1. A mounting unit for supporting an aligning round machine tool ways comprising an elongated first pillow block having a base and end faces, said base fastened to a machine tool frame, said first block having a cylindrical opening therethrough on an axis substantially parallel to said base and normal to the end faces, anti-friction bearing assembly received in said cylindrical central opening of said first block, a flangeless second block having a cylindrical central opening therethrough, said second block having a plurality of bores parallel to the axis of said cylindrical central opening of said second blocks, bolts having a diameter less than the diameter of said bores received therein and threadingly received in one end face of said first block, a unitary second anti-friction bearing assembly received in the cylindrical openings of each block.

4,120,539

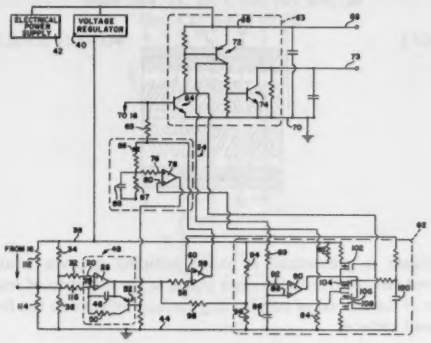
ADAPTIVE BRAKING SYSTEM WITH SPECIAL CONTROL FOR SLIPPERY SURFACES

Ralph W. Carp; Leoncio T. Ang, both of Newport News, Va.; Laurence D. Leadbetter, Loran, Ohio, and Grant Arthur Cornell, Walled Lake, Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Jun. 16, 1977, Ser. No. 807,283
Int. Cl.[2] B60T 8/00
U.S. Cl. 503—103 **10 Claims**

1. In a vehicle having a wheel, a brake controlling said wheel, and fluid pressure responsive means for actuating said brake, an adaptive braking system controlling communication to said fluid pressure responsive means comprising speed sensing means for generating a speed signal as a function of the rotational velocity of said wheel, modulator means for controlling communication to the fluid pressure responsive means, skid detecting means responsive to said speed signal for generating a skid detecting signal when an incipient skidding condition exists and terminating said skid detecting signal when the incipient skidding condition terminates, pressure command signal generating means responsive to the skid detecting signal for generating a pressure command signal representing a commanded fluid pressure level at said fluid pressure responsive

means, said pressure command signal varying between predetermined maximum and minimum limits, means responsive to said pressure command signal for generating a control signal actuating said modulator means, and means for delaying an



increase in fluid pressure communicated to said fluid pressure responsive means following a fluid pressure decrease in which the pressure command signal is at its minimum value while the skid detecting signal is generated.

4,120,540

AIRCRAFT AUTOMATIC BRAKING SYSTEM

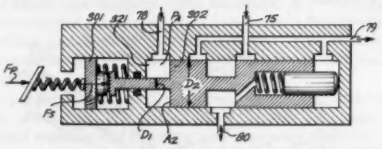
Garrett Howard Devlieg, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 632,113, Nov. 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 477,244, Jun. 7, 1974, Pat. No. 3,920,282, which is a division of Ser. No. 394,890, Sep. 6, 1973, Pat. No. 3,917,356. This application Feb. 17, 1977, Ser. No. 769,804

The portion of the term of this patent subsequent to Nov. 18, 1992, has been disclaimed.

Int. Cl.[2] B60T *11/12*

U.S. Cl. 303—117 **3 Claims**



3. In combination in an aircraft braking system:

first means for providing an electrically controlled hydraulic pressure command;

second means for generating a manually controlled hydraulic pressure command;

valve means responsive to said first and second means for providing hydraulic pressure to control aircraft braking;

said hydraulic pressure being exclusively responsive to said electrically controlled hydraulic pressure command when a proportional part of said electrically controlled hydraulic pressure command is greater than the force applied for generating said manually controlled hydraulic pressure command, said hydraulic pressure being representative of the sum of said applied force and said electrically controlled hydraulic pressure command when said proportional part of said electrically controlled hydraulic pressure command is less than said applied force. means for providing hydraulic pressure to control aircraft braking;

said hydraulic pressure being exclusively responsive to said electrically controlled hydraulic pressure command when a proportional part of said electrically controlled hydraulic pressure command is greater than the force applied for generating said manually controlled hydraulic pressure command, said hydraulic pressure being representative of the sum of said applied force and said electrically controlled hydraulic pressure command when said proportional part of said electrically controlled hydraulic pressure command is less than said applied force.

4,120,541

LUBRICATING DEVICE

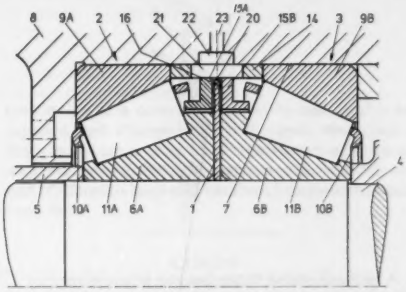
Siegfried Schiemann, Schweinfurt, Fed. Rep. of Germany, assignor to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Oct. 20, 1977, Ser. No. 844,138

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1976, 7633126[U]

Int. Cl.[2] F16C *33/66*

U.S. Cl. 308—187 **10 Claims**



1. A lubricating device for lubricating the bearing surfaces of a rolling bearing supporting a rotating shaft, comprising a disk having a facing surface, said disk coupled to and rotating with said shaft, a fixed support having a counter surface surrounding said disk so as to form a relatively narrow spacing between said disk facing surface and said counter surface, said support including a passageway from said counter surface to said bearing surface, a source of lubricant, and means passing said lubricant to said narrow spacing, and hydrodynamic means for providing a hydrodynamic force to said lubricant for forcing said lubricant from said narrow space to said bearing surface.

4,120,542

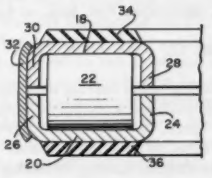
CAGELESS THRUST BEARING WITH UNGUIDED ROLLERS

Chander Prakash Bhateja, Harwinton; Richard Lassen Alling, Torrington, and Dean Edward Johnston, Thomaston, all of Conn., assignors to The Torrington Company, Torrington, Conn.

Filed Dec. 15, 1976, Ser. No. 750,611

Int. Cl.[2] F16C *19/34*

U.S. Cl. 308—219 **5 Claims**



1. A cageless thrust bearing with unguided cylindrical rollers comprising: a pair of axially separated flat thrust bearing raceways; a plurality of cylindrical rollers all having the same diameter located between said separated flat thrust raceways;

and a pair of axially extending radially separated containment members, the radial separations of the containment members being too great and the lengths of the cylindrical rollers too small for both ends of the radially aligned cylindrical rollers to contact the containment members at the same time when the containment members are concentric or for the containment members to cooperatively radially orient the cylindrical rollers.

4,120,543

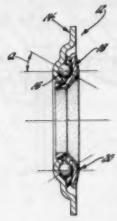
UNITIZED SEALED BALL THRUST BEARING

Pliney O. Greene, Jr., Sandusky, Ohio, and Darrell D. Pendleton, Belmont, N.C., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 27, 1977, Ser. No. 864,210

Int. Cl.[2] F16C *19/00*

U.S. Cl. 308—233 **3 Claims**



1. A unitized sealed thrust bearing comprising:

a first bearing race having a circular protrusion at the terminus of a conical skirt inclined toward a second bearing race,

a complement of antifriction elements disposed between said bearing races and rollably engaging respective confronting bearing raceways thereof,

said second bearing race further having inner and outer circular sealing lips of elastomeric material bonded thereto which cooperate with surfaces of said first race to provide seals between the bearing races radially inwardly and outwardly of the antifriction elements,

one of said sealing lips being attached to a flared portion of the second bearing race in close proximity to the circular protrusion and having a radially facing circular notch receiving the circular protrusion to provide a unitized assembly, said one sealing lip being of sufficient stiffness to permit snap assembly of the bearing races and the subsequent secure retention of the bearing components in a unitized assembly.

4,120,544

SELF-PRESSURIZING RADIAL FRICTION BEARING

Wolfgang Hüber, Schweinfurt, Fed. Rep. of Germany, assignor to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

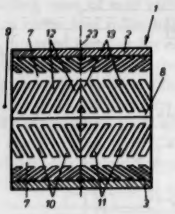
Filed May 11, 1977, Ser. No. 795,934

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1976, 2624849

Int. Cl.[2] F16C *32/06, 17/02*

U.S. Cl. 308—240 **12 Claims**

1. In a self-pressuring radial bearing including a sleeve operable with a rotatable shaft and a quantity of fluid lubricant from a lubricant supply space, the sleeve bore and shaft circumference comprising adjacent bearing surfaces respectively in sliding engagement, and the bearing including in a first of said bearing surfaces a plurality of pumping grooves oriented at acute angles to the axis of the bearing, the improvement in combination therewith wherein said first bearing surface has defined therein a plurality of axial flutes spaced circumferentially and communicating with said lubricant supply space, a plurality of said pumping grooves are distributed on each side of each flute, each pumping groove having an open end communicating with said flute and an opposite closed end spaced in the circumferential direction from the open end, whereby



lubricant is pressurized in those pumping grooves whose closed end relative to the open end is in the direction of rotation of the second of said bearing surfaces relative to the first of said surfaces.

4,120,545

HOUSING FOR AN ELECTRICAL OR ELECTRONIC APPARATUS

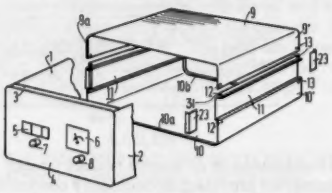
Heinz Happak, and Alfred Wittmann, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 26, 1977, Ser. No. 800,896

Claims priority, application Fed. Rep. of Germany, May 28, 1976, 2624148

Int. Cl.[2] A47B *81/06;* H05K *5/00*

U.S. Cl. 312—7 R **11 Claims**



1. A housing for a self-supporting interior structure of electrical and electronic apparatus, comprising:

upper and lower U-shaped casing members, each casing member having two edge walls, a front panel, and a side connecting and spacing member joining by the edge walls the upper and lower casing members on each of opposite sides of the cabinet; and

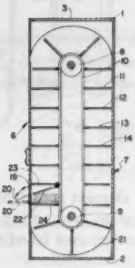
each side connecting and spacing member comprising an integral extruded U-shaped channel forming a lateral depression extending inwardly of said casing member edge walls, said channel having flat upper and lower inwardly extending surfaces and a flat vertical wall inwardly of the edge walls extending between the upper and lower surfaces, flanges being provided extending above the upper surface and below the lower surface, said flanges attaching the spacing members to the edge walls, and said vertical wall and upper and lower surfaces of each U-shaped channel forming a guide rail.

4,120,546

ROTARY FILE

Orin C. Veigel, Afton, Wyo., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Nov. 11, 1977, Ser. No. 850,720
Int. Cl.[2] A47B 49/00
U.S. Cl. 312—134 1 Claim



1. A rotary file, comprising

a housing having a bottom, a top spaced from the bottom and substantially parallel thereto, a pair of spaced substantially parallel sides joining the top and bottom and substantially perpendicular thereto, a front joining the top, bottom and sides and substantially perpendicular thereto, and a back joining the top, bottom and sides and substantially perpendicular thereto and in spaced substantially parallel relation with the front;

a pair of elongated cylindrical rollers rotatably mounted in the housing in spaced parallel relation parallel to the top and bottom, one of the rollers being in proximity with the top of the housing and the other of the roller being in proximity with the bottom of the housing;

an endless belt mounted on and extending between the rollers and rotatable therewith;

a plurality of shelf members affixed to the belt and extending substantially perpendicularly from said belt in spaced substantially parallel relation for releasably storing files between next-adjacent shelf members;

motive means coupled to one of the rollers for rotating said rollers and thereby rotating said belt to move said shelf members cyclically from top to bottom to top inside the housing;

an opening formed in the front of the housing and covered by a selectively openable door to provide access to the shelf member for inserting and removing files;

a substantially semicylindrical guide sheet at the bottom of the housing to prevent files from falling out from between the shelf members at the bottom of the cycle; and

a plurality of spring-biased follower members affixed to the shelf members for releasably clamping files stored between next-adjacent shelf members, each of said follower members being pivotally coupled to a corresponding one of said shelf members and having a spring urging it toward a next-adjacent one of said shelf members.

4,120,547

DISSECTING TRAY

G. Richard Price, Aberdeen, and Jeffrey N. Plant, Edgewood, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 23, 1976, Ser. No. 744,581
Int. Cl.[2] A61B 19/00; B01L 1/00; G01N 1/00
U.S. Cl. 312—209 6 Claims

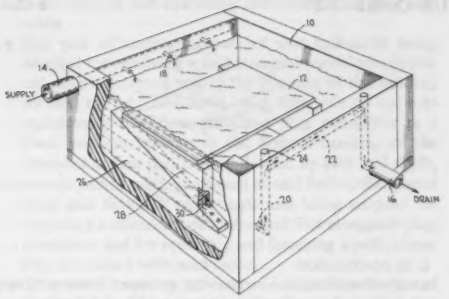
1. A dissecting tray comprising:

(1) tank means for containing dissecting fluid,

(2) a horizontal rigid platform in said tank means below the fluid level for supporting a specimen during dissection and mounting means for supporting said platform,

(3) a fluid supply means in a first side wall of said tank means for supplying dissecting fluid to said tank means near the fluid level, and

(4) drain means including a fluid pickup in a second side wall of said tank means opposite said first sidewall and near the bottom of said tank means for maintaining the fluid in said tank means at a constant level while said fluid is being supplied, and wherein said fluid supply means and said drain means are arranged and constructed such that a one way passage of fluid can be maintained horizontally across said platform to keep said platform immersed in a bath of fresh fluid.

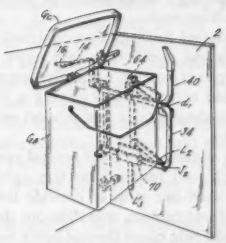


4,120,548

DISPLACEABLE GARBAGE BIN HOLDER

Nathan Manor, 69 Zahal St., Tel Aviv, Israel

Filed Dec. 17, 1976, Ser. No. 751,944
Claims priority, application Israel, Sep. 16, 1976, 50492
Int. Cl.[2] A47B 51/00
U.S. Cl. 312—249 8 Claims



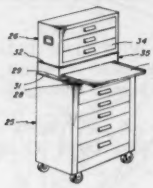
1. A displaceable garbage-bin holder having a support frame which is pivotably connected to a bracket means for mounting the holder onto a stationary support and swingable about a vertical axis provided at a rear side of said frame and a linkage system for the vertical displacement of the bin, the linkage system comprising first, second and third link-bars; said first link-bar being pivotably mounted at one end to the front end of the frame by a first journal; said second link-bar being pivotably mounted at one end to the front end of the frame by a second journal located below said first journal; said third link-bar being pivotably mounted to the opposite ends of said first and second link-bars by third and fourth journals, respectively; said first, second and third link-bars comprising a spacer means; means for suspending a garbage-bin on said third link-bar; and a handle for pivotting the linkage system about said first and second journals so that said third journal is displaced from a lower position to an elevated position beyond the upper dead-center of the said linkage system defined by a line passing through said first and second journals, for stably supporting said linkage system in said elevated position.

4,120,549

SHEET METAL TOOL CHEST SUPPORT WITH SLIDING WORK SHELF

Harvey Lee Bureau, 8 Pleasantdale Ave., Waterville, Me. 04901

Filed Apr. 27, 1977, Ser. No. 791,412
Int. Cl.[2] A47B *88/00*
U.S. Cl. 312—253 **6 Claims**



1. In combination:

a roll-around tool cabinet having an upper, horizontal work bench surface of predetermined width and depth;

a multiple drawer tool chest having a front with at least one slide out drawer at the bottom thereof, and a bottom surface of less depth than, but equal width to, said upper work bench surface said tool chest being removably supported at the rear of said work bench surface with a narrow forward portion of said work bench surface exposed as a shelf-like strip;

and a removable support interposed between said chest and cabinet, said support including an upstanding front wall and a pair of integral upstanding side walls, all of sheet metal, and of uniform height within the range of 2 to 6 inches, said support removably seating said chest at a level well above the upper surface of said cabinet with said shelf-like strip exposed;

said support defining a hollow enclosure having back wall means including an access opening for access to said enclosure and having a shelf opening in the lower portion of said upstand-front wall;

a shelf slidable in said shelf opening, said shelf being coextensive in depth and width with said work bench surface, having a rearward portion normally housed in the lower portion of said enclosure and having a forward portion normally extending outside said support and covering said shelf-like strip;

said shelf being slidable from said normal position to a position in which said forward portion extends forwardly beyond said shelf-like strip to provide the normal work bench area of said cabinet, said slide-out shelf is formed of sheet metal, the side edges thereof being bent upwardly to form side flanges and the front edge being bent downwardly to form a stop, said shelf includes a plurality of channel members of sheet metal affixed to the underside thereof and extending from front to back to reinforce said shelf when extended,

and floor means extending across the interior of said enclosure for slidably guiding said shelf.

4,120,550

MULLION ADJUSTING DEVICE

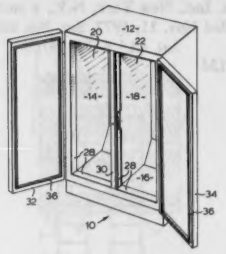
Raymond Robert Sherburn, Montreal, Canada, assignor to Canadian General Electric Company, Limited, Toronto, Canada

Filed Sep. 15, 1977, Ser. No. 833,780
Int. Cl.[2] F25B *47/00*; E06B *1/20*
U.S. Cl. 312—296 **11 Claims**

1. In a domestic refrigerating appliance having at least two separate compartments and at least two doors sealing said compartments, said compartments being separated by a divider panel having a mullion cover upon which said doors seal,

The improvement wherein said mullion cover is interconnected intermediate the ends thereof to the wall structure defining said compartments by

(a) spring means acting to bias said mullion cover in a first direction in the plane of said divider panel



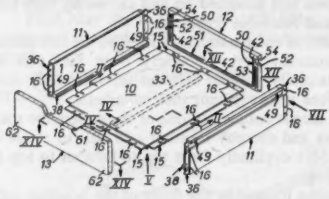
(b) a variable length element actuatable to bias said mullion cover in opposition to said spring means, whereby the curvature of said cover may be adjusted.

4,120,551

INTERLOCKING DRAWER ASSEMBLY

Lucien Joseph Godtschalck, Orsay, France, assignor to Krieg & Zivy Industries, Le Plessis-Robinson, France

Filed Oct. 26, 1976, Ser. No. 735,544
Claims priority, application France, Oct. 31, 1975, 75 33328
Int. Cl.[2] A47B *88/00*
U.S. Cl. 312—330 R **3 Claims**

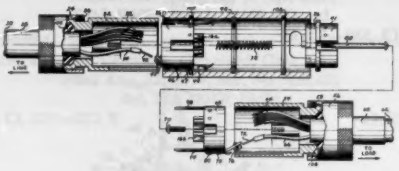


1. A readily mountable drawer comprising a bottom panel, two side panels, a front panel and a back panel, pairs of complementary positive detent means integrally formed in one piece with respective juxtaposed panels for hand assembling said drawer by substantially exclusively unidirectional relative displacement of said juxtaposed panels until they are locked in place relative to one another, each of said panels being connected to an adjacent one of said panels by an interlocking connection including an elongated male strip generally lying in a plane and a similarly elongated female part defining an elongated groove, and said detent means including each male strip being at least partially discontinuous in a transverse direction to define a pair of independent hooks, each hook lying generally coplanar with the remainder of said male strip and having a free portion lying along a free edge of said male strip, and each hook free portion having on one surface thereof a transverse detent projecting normal to said plane, said female part having a notch opening from the interior of said groove and receiving each detent, and the opposite surface of each hook free portion having a relieved part extending transversely away from said free edge beyond said detent to permit flexing of said hook free portion relative to the remainder of said hook and passage of said hook free portion into said groove together with entry of said detent into said notch.

4,120,552
SWITCHABLE ELECTRICAL CONNECTOR

Edward D. Winkler, Reading, and Earl E. Dalrymple, Waltham, both of Mass., assignors to Anderson Power Products, Inc., Boston, Mass.

Filed Jul. 7, 1977, Ser. No. 813,521
Int. Cl.[2] H01R *13/54, 33/30*
U.S. Cl. 339—90 R **10 Claims**

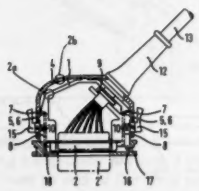


1. A switchable electrical connector comprising:
a first generally cylindrical housing;
first and second movable electrical connectors mounted in said first generally cylindrical housing for relative axial movement and relative unitary rotational movement therein, said first and second connectors being adapted for electrical engagement and disengagement with each other;
a third movable electrical connector mounted in said first housing for axial and rotational movement therein, said third electrical connector being electrically connected to said second electrical connector;
a second generally cylindrical housing having an outside diameter less than the inside diameter of said first generally cylindrical housing;
a fourth electrical connector mounted in said second generally cylindrical housing and adapted for electrical engagement and disengagement with the third electrical connector mounted in said first generally cylindrical housing; and,
cooperatively operative interlock means mounted on said first and second housings for preventing: (i) the electrical engagement of said first and second electrical connectors before the electrical engagement of said third and fourth electrical connectors; and (ii) the electrical disengagement of said third and fourth electrical connectors before the electrical disengagement of said first and second electrical connectors.

4,120,553
PLUG HOUSING FOR MULTIPOLAR PLUG CONNECTORS

Edwin Muz, Mühlbach-Eppingen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation of Ser. No. 531,104, Dec. 9, 1974, abandoned. This application Oct. 6, 1977, Ser. No. 839,982
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1973, 7343790[U]
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—91 R **1 Claim**



1. In a plug housing for an elongated multi-pin electrical plug connector comprising, in combination:
two substantially identical mirror-image half-shells matable along peripheral side edges thereof to form a substantially rigid housing having a chamber therein with an opening along the bottom of said housing,
each of said half-shells having a plurality of cut-outs located along peripheral side wall portions thereof and a plurality of projections located along peripheral side walls thereof and extending outwardly from said side walls,
a first pair of mating cut-outs of said half-shells being adapted for receiving a first elongated multi-pin electrical plug connector within the opening of the housing formed by said half-shells, said first pair of cut-outs maintaining said first elongated plug connector in a fixed position relative to the bottom opening of the chamber within the housing formed by said half-shells,
a second pair of mating cut-outs of said half-shells spaced from said first pair of cut-outs and being adapted for receiving a connector cable for said first elongated plug connector and for receiving and fastening a pull-release clip associated with said cable,
a third pair of mating cut-outs of said half-shells spaced from said first and second pair of cut-outs and being adapted for receiving an externally actuable locking means,
a fourth pair of mating cut-outs of said half-shells spaced from said first, second and third pair of cut-outs and being adapted for receiving actuating elements for said locking means,
a first pair of mating projections of said half-shells being adapted for engaging cut-outs in a hood positionable over the housing formed by said half-shells,
a second pair of mating projections of said half-shells spaced from said first pair of projections and being adapted to contact inner surfaces of a hood positionable over the housing formed by said half-shells,
a third pair of mating projections of said half-shells spaced from said first and second pair of projections and being adaptable to mate with arresting projections of a connector receptacle positionable along a bottom of the housing formed by said shell halves;
a first elongated multi-pin electrical plug connector positioned within said first pair of cut-outs of said half-shells and across the bottom opening of the chamber within the housing formed by said half-shells;
a connector cable and associated pull-release clip associated with said cable positioned within said second pair of cut-outs of said half-shells, said cable being electrically connected with individual poles of said first multi-pin plug connector;
a connector receptacle having attached thereto a second elongated multi-pin plug connector matable with said first elongated plug connector, said connector receptacle being releasably attached along the bottom of the housing formed by said half-shells and in communication with the bottom opening of said housing,
said connector receptacle having arresting projections along inner side wall portions thereof, said arresting projections mating with said third pair of projections of said half-shells so that said second multi-pin plug connector mates with said first multi-plug connector;
an externally actuated locking means operationally associated with the housing formed by said half-shells, said locking means being adapted for releasably engaging said arresting projections of said connector receptacle and automatically locking said first and second elongated plug connectors together upon joining of said housing and said connector receptacle and releasing said plug connectors in response to external manipulation of said locking means,
said locking means comprising bent spring wires positioned within said third pair of cut-outs of said half-shells and actuating elements having surface portions in operational contact with said wires and being positioned within said fourth pair of cut-outs in said half-

shells, said actuating elements having surface portions extending externally of said housing for manipulation externally of said housing, and

a hood formed of a slightly elastic material adapted to fit over the housing formed by said half-shells and to hold said half-shells in an assembled position,

said hood having a plurality of cut-outs along peripheral side wall portions thereof adapted to mate with at least some of the plurality of cut-outs in the housing formed by said half-shells,

said hood having interior walls defining a chamber having a bottom opening therein for receiving the housing formed by said half-shells;

said inner surfaces of the hood being in contact with said second pair of mating projections of said half-shells so as to define a space between said inner surfaces and the exterior wall of said housing;

at least one of the cut-outs of said hood engaging said first pair of mating projections of said half-shells and maintaining said hood in fixed relation to the housing formed by said half-shells,

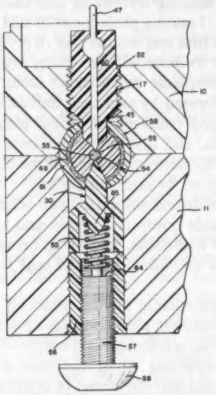
whereby said hood is rapidly attachable to the housing formed by said half-shells in a simple and substantially frictionless transitory movement.

4,120,554

COAXIAL CABLE CONNECTOR

Edward Armond Bianchi, and Edger Wilmot Forney, Jr., both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 1, 1977, Ser. No. 820,504
Int. Cl.[2] H01R *11/20*
U.S. Cl. 339—97 R **17 Claims**



1. A coaxial cable connector comprising:

first and second matable housing means comprising means for retaining a coaxial cable having a center conductor and an outer conductor in a predetermined position as said first and second housing means are mated;

a first conductive center conductor probe having an insulative sheath therearound position in said first housing means to penetrate into said coaxial cable and press against said center conductor of said coaxial cable as said first and second housing means are mated, with said insulative sheath insulating said conductive probe from the outer conductor of said coaxial cable;

a spring loaded back-up probe position in said second housing means to penetrate into said coaxial cable and press against the center conductor thereof at a point opposite said first probe; and

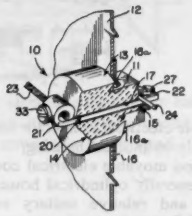
contact means positioned in one of said first and second housing means to penetrate and make contact with said outer conductor.

4,120,555

CONNECTOR-TERMINAL ASSEMBLY FOR ELECTRICAL CONDUCTORS

Ned H. Shiflett, Charden, and William J. Seybert, Cincinnati, both of Ohio, assignors to Eltra Corporation, New York, N.Y.

Filed Apr. 4, 1977, Ser. No. 784,567
Int. Cl.[2] H01B *17/26*; H01R *7/12*
U.S. Cl. 339—126 R **10 Claims**



1. In an electrical connector assembly adapted for mounting through a hole in a firewall, said assembly including:

a single insulator structure with a first portion thereof having a cross-section substantially of like shape and smaller than said firewall hole for positioning therethrough, and a second portion adjacent to and integral with said first portion having a cross-section larger than said firewall hole for abutting said firewall when positioned adjacent thereto; said insulator including a connector mounting hole extending through both first and second portions;

an elongate electrical connector positioned in said connector mounting hole and including opposed ends which extend outwardly of both respective insulator portions defining electrical terminals thereon, each electrical terminal including a fastener capable of retaining an electrical conductor thereon, said connector being free of tensile stress along the length thereof as mounted in said connector mounting hole; and

means for anchoring said insulator in mounted position in said firewall hole;

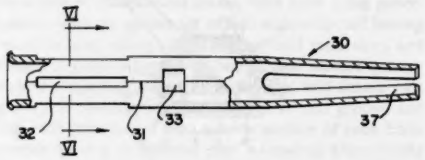
the improvement wherein said anchor means is adapted to be secured on said insulator in spatial relation to said connector, and said insulator is free of compressive stress in a direction parallel to the axis of said connector hole therein.

4,120,556

ELECTRICAL CONTACT ASSEMBLY

Clifford R. Waldron; Karl W. Yonkers, both of Unadilla, and Herbert K. Uhlig, Bainbridge, all of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Mar. 1, 1976, Ser. No. 662,677
Int. Cl.[2] H01R *11/08*
U.S. Cl. 339—142 **30 Claims**



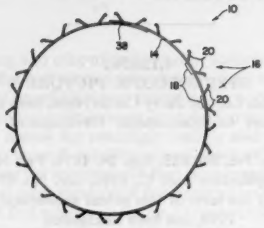
1. A one piece unitary electrical contact stamped and formed from a sheet of metal, said contact comprising:

a sleeve having an open seam extending the entire axial length of said sleeve, said sleeve having a front mating portion, and a rear wire receiving portion having at least four slots in the wall thereof, with the longitudinal axis of each slot extending parallel to the longitudinal axis of said sleeve, said slots symmetrically arranged around the longitudinal axis of said sleeve.

4,120,557
ELECTRICAL CONNECTOR

Raymond G. Horrocks, Fairview Park, Ohio, assignor to The Scott & Fetzer Company, Cleveland, Ohio

Filed Aug. 22, 1977, Ser. No. 826,480
Int. Cl.[2] H01R *13/06*
U.S. Cl. 339—252 R 12 Claims

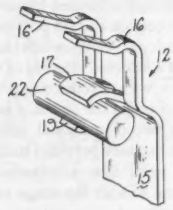


1. An electrical connector strip adapted to interconnectingly engage complementary male and female members of a plug-and-socket connector each defining a cylindrical interconnection surface, comprising a strip of annular shape and integrally and unitarily provided with a plurality of resiliently deformable, substantially parallel louvers constituting a cylindrical tubular array of louvers, a pair of annular rail portions of said strip unitarily connecting the louvers at opposite ends of the tubular array, the louvers being distributed around said tubular array in spaced relation to each other, the louvers comprising bottom portions adapted to be supported against one of said cylindrical interconnection surfaces and pairs of flange portions on each side of each bottom portion and slanting upwardly for engagement with the other of said cylindrical interconnection surfaces.

4,120,558
SOLDER BEARING TERMINAL

Jack Seidler, New Rochelle, N.Y., assignor to North American Specialties Corporation, Flushing, N.Y.

Filed Aug. 15, 1977, Ser. No. 824,441
Int. Cl.[2] H01R *11/06*
U.S. Cl. 339—275 T 4 Claims

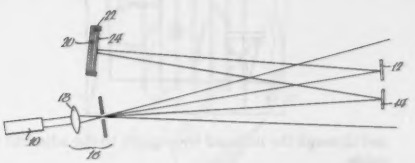


1. A terminal clip for securement to a contact pad on a substrate comprising a clip body portion, a plurality of contact fingers projecting from an end of the body portion and bent to define a gap adapted to receive the edge of a substrate, and a cylindrical mass of solder, said fingers including a pair of fingers spaced laterally apart and located distally of the clip and a central finger having a width corresponding substantially to the distance between said spaced fingers, said central finger including means adapted to extend at least 180° around said cylindrical mass of solder for holding said mass of solder in a position adjacent said gap and on the side thereof nearer the clip body portion, at least a portion of said means being narrower than the central finger.

4,120,559
METHOD OF ESTABLISHING SECRET INFORMATION

Nils Abramson, and Hans Bjelkhagen, both of Stockholm, Sweden, assignors to AB ID-kort, Stockholm, Sweden

Filed Sep. 27, 1976, Ser. No. 726,735
Claims priority, application Sweden, Oct. 1, 1975, 7511006
Int. Cl.[2] G03H *1/04*
U.S. Cl. 350—3.60 18 Claims



1. A method of establishing and reading secret information in the form of a holographic interference pattern comprising:

exposing a first holographic plate with laser light reflected from an object and with a reference laser light to form a first hologram;

deforming the laser light reflected from the object in accordance with the secret information to be established;

exposing a second holographic plate with the deformed laser light reflected from the object and with the reference laser light to form a second hologram;

maintaining the first hologram separate from the second hologram to keep secret the secret information;

combining the first and second holograms by spacing the first and second holograms apart from each other by a predetermined distance; and

simultaneously illuminating the first and second holograms with a laser light for observing the secret information.

4,120,560
OPTICAL WAVEGUIDE NETWORK

Peter Baues, Krailling, and Gerhard Winzer, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation of Ser. No. 692,739, Jun. 4, 1976, abandoned. This application Jan. 20, 1978, Ser. No. 871,011
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1975, 2525678
Int. Cl.[2] G02B *5/14;* G02F *1/13*
U.S. Cl. 350—96.14 4 Claims

1. An optical waveguide network including means for switching a guided signal from one to the other of two adjacent parallel disposed optical waveguides comprising:

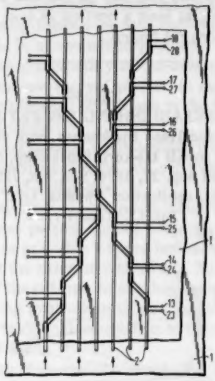
a substrate of electro-optical material;

a plurality of parallel disposed optical waveguides formed on said substrate;

a plurality of electrode pairs including at least two for each optical waveguide being disposed above the plane of said waveguides for inducing in said substrate a waveguide between two adjacent channels when a voltage is applied to an electrode pair;

said electrode pairs when a voltage is applied thereto causing an induced optical waveguide to be induced in the substrate between said two adjacent waveguides and causing the relative refractive index of the substrate to change with respect to that of the optical waveguide so

that it is greater than that of the optical waveguide, whereby the guided wave is transferred to the substrate

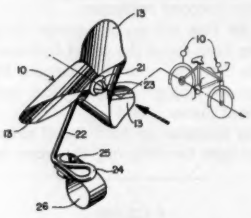


and through the induced waveguide to the adjacent waveguide.

4,120,561
LIGHT REFLECTIVE SIGNALING AND WARNING DEVICE

Clinton M. Burkholder, 11 Bowman St., Westborough, Mass. 01581

Filed Mar. 4, 1976, Ser. No. 663,925
Int. Cl.[2] G02B 5/12
U.S. Cl. 350—99 **3 Claims**



1. A light retroreflective signaling and warning device comprising:

a flexible unitary light retroreflecting rotatable element including a rotatably supported central portion in turn supporting multiple separate radially extended and returned portions all arcuately curved and mutually convergent so their respective extremities are all overlapped and mutually rotatably supported coaxially with said central portion,

said central portion and said radially extended and returned portions of said rotatable element being so shaped and arranged that light rays directed toward the center of a reference sphere enveloping said device, from any area on the surface of the reference sphere, are retroreflected toward their source,

the respective opposing surfaces of said flexible central portion and said flexible extended and returned portions of said rotatable element each being completely covered with a layer of light transparent material having a smooth damage resistant outer surface and protecting a continuous array of very small individually operative and collectively effective light retroreflecting elements,

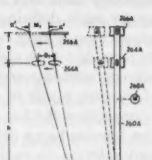
said respective layers of light transparent material respectively protecting said arrays of light reflecting elements also together enclosing an interposed opaque flexible central layer of material with its opposite sides comprising smooth light reflective surfaces, and

each of the opposing surfaces of said flexible rotatable element being a conspicuously different predetermined color so that the single color or the respective configurations and the relative dispositions of the respective conspicuously different predetermined colors visible to an observer adjacent to the source of light retroreflected by said signaling and warning device indicates to the observer the spacial orientation of said signaling and warning device relative to the observer, and any progressive change in the color configurations and the color content of the retroreflected light seen by the observer signals the sense and the magnitude of a progressive change in the spacial orientation of said signaling and warning device relative to the position of the observer.

4,120,562
STEREOSCOPIC PICTURE

Allen Kwok Wah Lo, and Jerry Curtis Nims, both of Dunwoody, Ga., assignors to Dimensional Development Corporation, Atlanta, Ga.

Division of Ser. No. 508,823, Sep. 24, 1974, Pat. No. 3,953,869.
This application Apr. 12, 1976, Ser. No. 676,385
The portion of the term of this patent subsequent to Apr. 27, 1993, has been disclaimed.
Int. Cl.[2] G02B 27/22; G03B 27/32, 35/14
U.S. Cl. 350—130 **1 Claim**



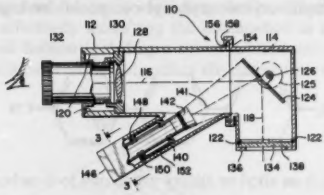
1. In an image array formed on the photosensitive surface of lenticular print film of lenticule width *w*, said image array consisting of a multiplicity of image bands each of which is aligned with a lenticule of the film and each of which comprises N condensed images formed by projecting through a projecting lens and onto the aligned lenticule a portion of each of a corresponding N two-dimensional views of an object field taken from spaced vantage points, the improvement wherein:

each condensed image is formed by continuously changing the angle of projection of said portion of the corresponding two-dimensional view, while maintaining the projected image of a selected element of the two-dimensional view in registry with a reference point and while maintaining the ratio of (1) the distance between said selected element of the two-dimensional view and its projecting lens and (2) the distance between such projecting lens and the lenticular print film substantially constant, by an amount sufficient to scan the image of said portion over a distance along the photosensitive surface such that said each condensed image occupies a width of substantially *w*/N, whereby said scanning results in said each condensed image being greater in width than the width *m* of an individual lineiform image formed by the aligned lenticule of said portion of the corresponding two-dimensional view, said each condensed image being substantially in focus and of substantially uniform image density across the fully width *w*/N thereof.

4,120,563
REFLECTING AND MAGNIFYING VIEWING APPARATUS

John Stefanou, 31 Meadow St., East Orange, N.J. 07017

Filed Jan. 5, 1977, Ser. No. 756,887
Int. Cl.[2] G02B 27/00
U.S. Cl. 350—235 6 Claims

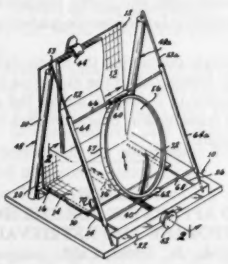


1. Reflecting and magnifying viewing apparatus comprising first tube means and second tube means joined to one another through a first coupling means extending around said first tube means, a second coupling means extending around said second tube, sealing means for rotatingly sealing said first coupling means to said second coupling means, both of said coupling means allowing for rotating said first tube means with respect to said second tube means and for preventing the leakage of light into said first tube means and said second tube means both of said coupling means being open towards the center thereof to allow the passage of light through said first tube means and said second tube means, said first tube means having an open end and said second tube means having an open end, the longitudinal axis of said first tube means and the longitudinal axis of said second tube means intersecting one another at an angle less than 180°, reflecting means positioned in said second tube means, said reflecting means being mounted on pivot means, the rotational axis of said pivot means being parallel to the surface of said reflecting means and being intersected by the longitudinal axis of said second tube means, substantially in a transverse manner, illuminating means in said first tube means, said illuminating means being positioned to reflect on said reflecting means, magnifying means positioned in at least one of said open ends of said tubes.

4,120,564
READING STAND WITH MAGNIFIER

Roberto Rios, 533 E. 182nd St., Carson, Calif. 90746

Filed Feb. 7, 1977, Ser. No. 765,975
Int. Cl.[2] G02B 27/02
U.S. Cl. 350—241 5 Claims

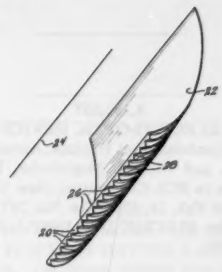


1. As an article of manufacture, a reading and magnifying stand comprising in combination, a base, a carrier for reading material having an upright part positioned for fore and aft adjusting movement relative to the base, a magnifying lens and a supporting frame for the lens positioned to carry the lens forwardly of the said carrier and means for adjusting the magnifying lens in directions normal to each other, the carrier including adjusting means adjustable from the front of the article from a position in front of the magnifying lens, the said adjusting means comprising a lead screw cooperable with a block carried by the said carrier and having an adjusting knob at its end.

4,120,565
PRISMS WITH TOTAL INTERNAL REFLECTION AS SOLAR REFLECTORS

Arnulf Rabl, and Veronika Rabl, both of Downers Grove, Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 16, 1977, Ser. No. 807,105
Int. Cl.[2] G02B 5/04
U.S. Cl. 350—286 9 Claims



1. In a radiant energy concentration collection device having at least one reflective wall of particular contour for directing received radiant energy to a particular location in concentrated form, the improvement in said wall, comprising:

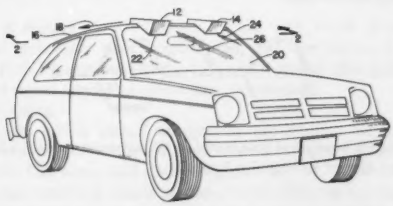
a plurality of rectangular prisms positioned so that the frontal faces thereof abut and correspond in contour to said particular contour,

the prisms being aligned so that both rectroreflection and specular reflection by total internal reflection associated with each prism is toward the particular location.

4,120,566
REARVIEW APPARATUS FOR VEHICLES

Salvatore Sanci, and Innocenzio Di Mauro, both of 71 Wolverleigh Blvd., Toronto, Ontario, Canada

Filed Apr. 18, 1977, Ser. No. 788,361
Int. Cl.[2] G02B 5/08
U.S. Cl. 350—302 9 Claims



1. A rearview apparatus for vehicles for providing a rear field of vision via the roof top of a vehicle comprising a pair of periscope devices, said pair of periscope devices each having an open rear end for interception therein of a portion of the forwardly projecting light rays extending from the rear of said vehicle towards the front of said vehicle and an open rear lower portion, said open rear lower portion being disposed adjacent the front windshield of said vehicle, an image viewing apparatus having a display panel, a pair of image diverting assemblies for directing light rays transmitted through said

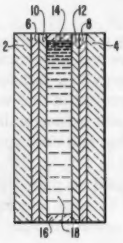
front windshield by said pair of periscope devices to said image viewing apparatus, image size expanding means for expanding said light rays directed by said image diverting assemblies into expanded size light rays so as to provide an expanded view thereof upon said display panel, said image viewing apparatus and said pair of image diverting assemblies being disposed within the interior confines of said vehicle and affixed thereto, light filtering means for selectively filtering said expanded size light rays before said expanded size light rays are displayed on said display panel, the apparatuses comprising said light filtering means and said image expanding means being located in a first housing, said apparatus comprising said light filtering means being located adjacent said display panel, flexible packing means for excluding vision obstructing objects from between said open rear lower portion and said front windshield.

4,120,567

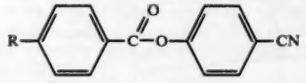
ELECTRO-OPTIC DEVICE

Lawrence Alan Goodman, East Windsor; Aaron William Levine, Lawrenceville, and Dietrich Meyerhofer, Princeton, all of N.J., assignors to RCA Corporation, New York, N.Y.

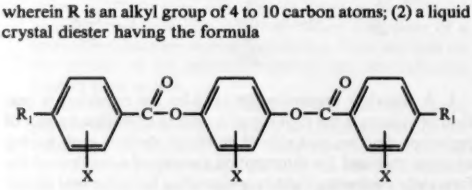
Filed Feb. 11, 1977, Ser. No. 767,957
Int. Cl.[2] C09K *3/34*; G02F *1/13*
U.S. Cl. 350—350 **2 Claims**



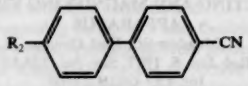
1. An electro-optic device having an improved viewing angle comprising a nematic liquid crystal composition between two electrodes, wherein the liquid crystal composition has an index of refraction anisotropy of less than 0.23 and contains a mixture of at least one compound from each of the following groups of liquid crystal compounds (1) a liquid crystal ester having the formula



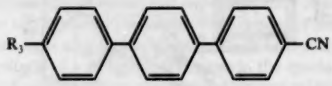
wherein R is an alkyl group of 4 to 10 carbon atoms; (2) a liquid crystal diester having the formula



wherein R_1 at each occurrence is an alkyl group of 1 to 10 carbon atoms, and X at each occurrence is hydrogen or a methyl group with the proviso that at least one X is methyl; (3) a liquid crystal biphenyl having the formula



wherein R_2 is an alkyl or alkoxy group of 3 to 8 carbon atoms; and (4) a liquid crystal terphenyl compound having the formula



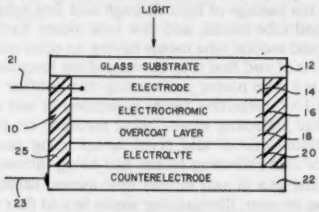
wherein R_3 is an alkyl or alkoxy group of 4 to 6 carbon atoms.

4,120,568

ELECTROCHROMIC CELL WITH PROTECTIVE OVERCOAT LAYER

Satyendra Kumar Deb, East Brunswick, and Horst Witzke, Princeton, both of N.J., assignors to Optel Corporation, Princeton, N.J.

Filed Jan. 12, 1977, Ser. No. 758,734
Int. Cl.[2] G02F *1/00*
U.S. Cl. 350—357 **18 Claims**



1. An electrochromic device comprising:
a transparent substrate for admitting impinging light into the device;
an electrode deposited, along a first surface thereof, on the substrate;
an electrochromic layer deposited on an opposite surface of the electrode;
an electrolyte layer positioned in spaced relationship to the electrochromic layer;
overcoat means positioned in contacting interposing relation to the electrochromic and electrolyte layers for protecting the electrochromic layer from degradation by the electrolyte layer;
a counterelectrode contacting the electrolyte layer; and
electrical leads connected to the electrode and counterelectrode for imposing a voltage across the device and controlling the transmission characteristics of the device to impinging light.

4,120,569

METHOD AND APPARATUS FOR THE HOLOGRAPHIC STORAGE AND RETRIEVAL

Chester L. Richards, Jr., Irvine, Calif., assignor to Marvin H. Kleinberg, Beverly Hills, Calif., a part interest

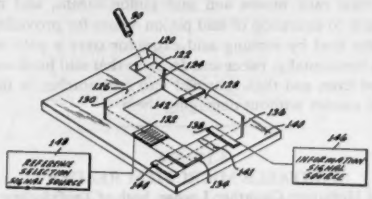
Continuation of Ser. No. 540,321, Jan. 13, 1975, abandoned. This application Jan. 7, 1977, Ser. No. 757,659
Int. Cl.[2] G03H *1/12*; G02F *1/03*
U.S. Cl. 350—3.68 **40 Claims**

1. Apparatus for creating in a storage medium a plurality of individually accessible holograms comprising in combination:
(1) storage medium;
(2) a source of substantially coherent illumination;

(3) a first path between said source and said medium, adapted to include an object whose image is to be recorded as a holographically stored wave front;

(4) a second path between said source and said medium adapted to exclude the object whose image is to be recorded said first and second paths intersecting in said medium; and

(5) spatial modulator means, interposed in said second path, for selectively modifying the illumination in a predetermined fashion including a set of submodulators each of which can controllably affect the correlation state of the



passing wave, for inducing a plurality of controlling spatial modulations on the passing wave generating mutually uncorrelated, spatially modulated sets; the members of the set of modulations produced by said modulator means being sharply autocorrelated, said submodulators being arranged along the path so as to successively affect the propagating wave; whereby a plurality of wave fronts each corresponding to a different image may be stored in said medium, each having associated therewith a particular modification of the illumination in said second path at the time the wave front is stored.

4,120,570

METHOD FOR CORRECTING VISUAL DEFECTS, COMPOSITIONS AND ARTICLES OF MANUFACTURE USEFUL THEREIN

Norman G. Gaylord, New Providence, N.J., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 698,592, Jun. 22, 1976, abandoned, which is a continuation of Ser. No. 548,209, Feb. 10, 1975, abandoned, which is a continuation-in-part of Ser. No. 461,882, Apr. 18, 1974, abandoned, which is a continuation-in-part of Ser. No. 263,541, Jun. 16, 1972, Pat. No. 3,808,178. This application Sep. 6, 1977, Ser. No. 830,509

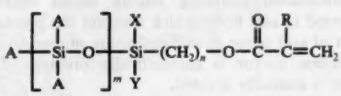
The portion of the term of this patent subsequent to Apr. 30, 1991, has been disclaimed.

Int. Cl.[2] **G02C** *7/04;* **C08F** *230/08*

U.S. Cl. 351—40 **1 Claim**

1. Method of treating visual defects of the human eye in the form of refractive errors which includes the step of fitting to the patient's eye a corrective contact lens fabricated from a solid copolymer of comonomers, said copolymer having increased oxygen permeability in comparison with poly(methylmethacrylate) and consisting essentially of

(a) about 10 to 70 parts by weight of a polysiloxanylalkyl ester of the structure.



wherein

(1) X and Y are selected from the class consisting of C_1–C_5 alkyl groups, phenyl groups and Z groups,

(2) Z is a group of the structure

(3) A is selected from the class consisting of C_1–C_5 alkyl groups and phenyl groups,

(4) R is selected from the class consisting of methyl groups and hydrogen,

(5) *m* is an integer frome one to five, and

(6) *n* is an integer from one to three; and

(b) about 30 to 90 parts by weight of an ester of a C_1–C_{20} monohydric alkanol and an acid selected from the class consisting of acrylic and methacrylic acids.

4,120,571

MOTION PICTURE CAMERA FOR USE WITH A CARTRIDGE FOR FILM HAVING A SOUND TRACK

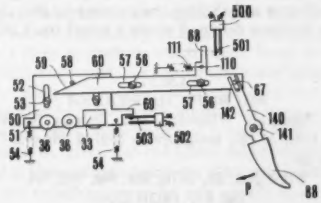
Keiichi Sakaguchi, Yokohama; Yoshio Komine, Tokyo; Toshikazu Ichiyanagi, Tokyo; Mamoru Shimazaki, Tokyo, and Kazuya Hosoe, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 462,526, Apr. 19, 1974, abandoned. This application Apr. 5, 1976, Ser. No. 673,619

Claims priority, application Japan, Apr. 23, 1973, 48-46385; Apr. 23, 1973, 48-46388

Int. Cl.[2] **G03B** *31/02*

U.S. Cl. 352—27 **8 Claims**



1. A motion picture camera for use with a roll of sound signal recordable photographic film, said film having a first film path for exposure of the film and a second film path for sound signal recording of the film, comprising:

a housing;

picture taking means mounted in the housing for taking motion pictures in the form of motion picture frames on the film along said first film path;

sound recording means mounted in the housing for recording sound signals on the film along said second film path;

framing speed changing means coupled to said picture taking means for selecting a predetermined motion picture framing speed applicable to simultaneous sound signal recording; and

connecting means coupled to said framing speed changing means and said sound recording means for changing over from a picture taking state without sound accompaniment to a picture taking state with sound accompaniment in response to the selecting operation of said framing speed changing means.

4,120,572
MULTIPLE FILM TYPE MOTION PICTURE PROJECTION

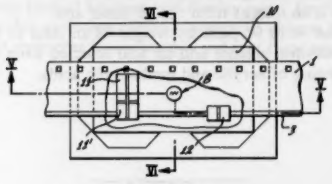
Michael Grallert, Brunswick, and Jörg Moschner, Salzgitter-Lebenstedt, both of Fed. Rep. of Germany, assignors to Rollei-Werke Franke & Heidecke, Brunswick, Fed. Rep. of Germany

Filed Dec. 21, 1976, Ser. No. 752,928

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 2558747

Int. Cl.[2] G03B *21/50*

U.S. Cl. 352—92 **7 Claims**



1. In a motion picture projector constructed for different operating conditions corresponding to different types of film, the projector including different sound pickup systems, such films having a leader portion provided with machine readible markings which characterize the particular type of film, the combination comprising:

a carriage disposed for movement transversely to the film;

pickup means on the carriage for reading the markings on said leader portion and generating pulses in response thereto, the carriage having a position so that the pickup means is disposed above the center of the film;

circuit means including logic decoding means coupled to said pickup means for receiving therefrom said pulses and providing control signals representative of the type of film as identified by the markings; and

control means coupled to said circuit means and operable by said signals for switching predetermined operating conditions in the projector including selection of frame rate of reproduction selection of a sound reproducing system in the projector and shifting the carriage so that the pickup means becomes disposed above a sound track of the film.

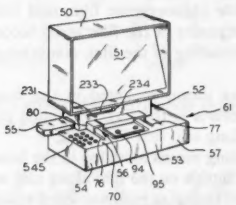
4,120,573
MICROFICHE READER

Robert F. Johnston, Wildwood, and Thomas R. Wells, Des Plaines, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Jun. 28, 1976, Ser. No. 700,704

Int. Cl.[2] G03B *23/08*

U.S. Cl. 353—27 A **21 Claims**



1. An automatic microfiche extractor for use with a microfiche reader wherein a library file of microfiche is stored in a cartridge in individual microfiche carriers so that it is not necessary to manually manipulate the individual microfiche, each of said carriers having a notch formed thereon, said extractor comprising means including at least one hook for automatically engaging said notches for extracting and feeding a selected microfiche from said cartridge to said reader and then returning said microfiche to the vacated cartridge location, an elongated plate-like means having said extractor hook means dependent from one end thereof, said elongated plate-like means moving back and forth in said extracting, feeding and returning motions and tipping up and down in a microfiche engaging and disengaging motion, rack means having a row of teeth and mounted on said plate-like means for supporting the extractor, pinion means meshing with the teeth of said rack means, said rack means having a first arm extending parallel to the back and forth movement of said extractor means and a second arm extending parallel to said up and down motion, automatic feed means comprising said extractor mounting means, said rack means and said pinion means, and means responsive to operation of said pinion means for providing the automatic feed by moving said extractor over a path which extends horizontally, raises and drops so that said hook may be removed from and then returned into said notches in the microfiche carrier without damaging them.

4,120,574
PORTABLE MICROFILM READER

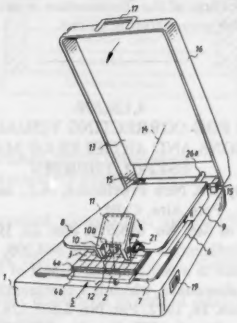
Wilfried Hofmann; Guenther Lueder, both of Taufkirchen; Walter Rauffer, Munich; John Krueger, Munich, and Adolf Koopmann, Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 27, 1977, Ser. No. 791,472

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1976, 2618472

Int. Cl.[2] G03B *23/08, 21/28*

U.S. Cl. 353—27 R **6 Claims**



1. In a portable microfim reader having a body, a projection light source projecting a light beam mounted in the body, a projection surface, a deflection mirror pivotally mounted on the body, the mirror deflecting onto the projection surface the projection beam which proceeds from a frame of microfilm that is to be viewed, and a cover hingedly attached to the rear of the body, said cover containing the projection surface,

the improvement comprising a mechanism adapted to automatically lift the deflection mirror into an erected, operative position when the cover is fully manually opened, and adapted to automatically fold the deflection mirror when the cover is manually closed,

said mechanism including linking means operationally mounted in said body which transmit the pivotal movement of said cover to said deflection mirror, so that said deflection mirror is automatically pivoted when said cover is manually pivoted,

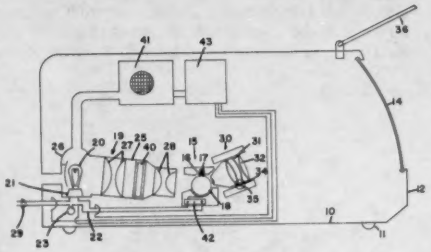
said linking means comprising at least one first linking rod slidably, movably mounted in said body and having a free end in contact with said cover; and

biasing means urging said free end of said first linking rod into contact with said cover.

4,120,575
TEST TUBE PROJECTION SYSTEM AND METHOD

Bert Bach, 270 West End Ave., New York, N.Y. 10023

Continuation-in-part of Ser. No. 740,002, Nov. 8, 1976, abandoned. This application Jul. 11, 1977, Ser. No. 814,261
Int. Cl.[2] G02B *21/36*; G03B *21/22*; G01N *21/00*
U.S. Cl. 353—39 **9 Claims**



1. A projection system for the viewing of an enlarged image of a layer of material temporarily formed on the interior of a test tube wall, comprising

a test tube having a curved wall with a predetermined curvature;

a base;

a holding means on the base to removably position the test tube at an angle to the vertical, said test tube being rotatable about its axis, the said angle to the vertical and rotation is such that a layer of material temporarily adheres to said interior wall above the normal level of the material in the test tube,

a light source positioned on one side of said test tube and directed to shine its light through said test tube and through said layer of material on the curved test tube wall;

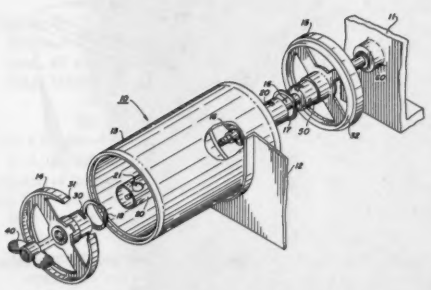
a projection lens means mounted on said base to receive said lighted image of said material and focus upon and project an enlarged image of said layer of material; and

a curved projection screen upon which said projection lens means projects its image, the curvature of said screen being substantially similar to the curvature of said test tube wall but on an enlarged scale, said projection screen having a concave side which receives said projected image and a convex side showing said image for viewing.

4,120,576
DRUM SUPPORT APPARATUS

Andrew N. Babish, Macedon, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 4, 1977, Ser. No. 784,083
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 DR **10 Claims**



7. In a xerographic apparatus including a photosensitive drum and a frame within which the xerographic apparatus is mounted, a shaft mounted on said frame, a tubular member fitted over said shaft, at least one hub adapted to be releasably connected to said tubular member and said shaft for supporting said drum and seated against said drum; the improvement comprising:

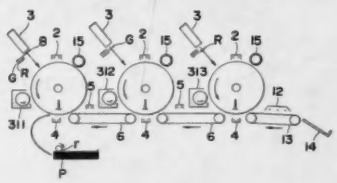
first means located on a portion of said bub that is adapted to cooperate with a second means located on said tubular member, and wherein rotation of said first means by approximately 20° engages said first means with said second means; and

securing means for establishing an equal distribution of force on said at least one hub in order to diminish circular drum run-out.

4,120,577
COLOR TRANSFER COPYING PROCESS AND APPARATUS USING CHARGE REMOVING ELECTRODES

Koji Watanabe, Tokyo; Mitsunori Ohta, Kunitachi, and Makoto Tomono, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 16, 1977, Ser. No. 807,015
Claims priority, application Japan, Jun. 25, 1976, 51-75197
Int. Cl.[2] G03G *15/01*
U.S. Cl. 355—4 **9 Claims**



1. A color transfer copying process for forming on a transfer sheet a colored image corresponding to an original by repeating for a prescribed number of times the procedure of: projecting a reflected ray image from the original to be copied on a photosensitive material uniformly charged by a charging electrode through a filter to form an electrostatic latent image on the photosensitive material, converting the latent image to a toner image by using a powdery developer containing a coloring toner and transferring electrostatically by means of a transfer electrode the toner image onto said transfer sheet, while using selectively blue, green and red filters, said process being characterized in that a charge-removing electrode is disposed in the vicinity of a transfer passage for said transfer sheet so that said electrode acts on said transfer sheet after completion of the transfer operation and said charge-removing electrode is energized in regular sequence with the same frequency as that of the transfer operations to diminish the retention charge of the coloring toner transferred onto the transfer sheet at the transfer operation, whereby it is possible at a subsequent transfer operation to transfer and superpose a predetermined quantity of the coloring toner of the coloring toner image on the photosensitive material onto the transfer sheet even in areas overlapped with the coloring toner image formed at the preceding transfer operation.

6. A color transfer copying apparatus for forming a colored image corresponding to an original comprising:

means for projecting an image from the original to be copied onto a photosensitive material uniformly charged by a charging electrode through a filter to form an electrostatic latent image on the photosensitive material;

means for converting the latent image to a toner image by using a powdery developer containing a coloring toner;

first electrostatic means for transferring electrostatically the toner image onto a transfer sheet;

and second electrostatic means disposed in the vicinity of a

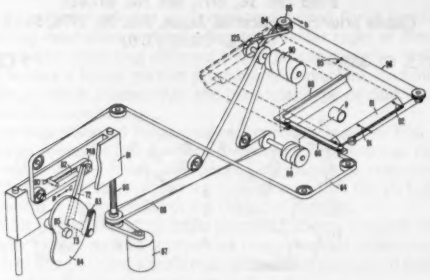
transfer passage for the transfer sheet for acting on the transfer sheet after completion of the transfer operation to diminish the retention charge of the coloring toner transferred onto the transfer sheet at the electrostatic transfer operation, whereby it is possible at a subsequent transfer operation to transfer and superpose a predetermined quantity of the coloring toner of another coloring toner image on the photosensitive material onto the transfer paper in an area overlapped with the coloring toner image formed by said first electrostatic means.

4,120,578

CONTINUOUSLY VARIABLE REDUCTION SCANNING OPTICS DRIVE

Raymond Alex Daniels; David Kent Gibson; Paul Kummli, all of Boulder; Spencer Allan Snell, Lyons, and Michael Henry Ulrich, Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 7, 1976, Ser. No. 721,124
Int. Cl.[2] G03G *15/28*
U.S. Cl. 355—8 **24 Claims**



1. A continuously variable reduction imaging system for an electrophotographic copier machine, wherein a document to be copied is typically of rectangular shape, comprising:

a glass platen upon which said document to be copied is placed;

a mount for carrying photoreceptive material;

main motive means for moving said mount;

a source of illumination;

a document scanning system comprised of a scanning carriage for traversing said document and directing illumination from said source to said document;

means for driving said scanning carriage;

an optics system for direction illumination from said document to produce an image on said photoreceptive material, said optics system including a lens; and

an optics positioning system including means for adjusting said lens to continuously variable settings in a continuously variable manner to achieve any desired magnification ratio between two boundaries and including locating means for maintaining the reference edge of the document at a constant position on the image plane regardless of the continuously settable magnification ratio selected.

4,120,579

IMAGING SYSTEM FOR A PHOTOCOPYING DEVICE

Dominick J. Maiorano, West Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 2, 1976, Ser. No. 719,757
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—11 **5 Claims**

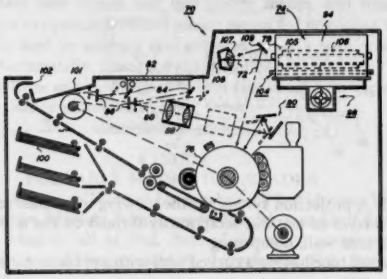
1. Image forming apparatus including a stationary illumination source, said apparatus comprising:

belt means for moving a document past said illumination source, said illumination source being disposed adjacent one side of said belt;

means positioned to said one side of said belt for projecting a light pattern reflected from said document along an optical path;

a photoreceptor having a uniform, electrostatically charged portion positioned in said optical path whereby said light pattern impinges upon an area thereof and causes the charged portion to be discharged in accordance with said light pattern; and

specular reflector means positioned adjacent the opposite side of said belt to reflect illumination from said source adjacent all the edges of said document along said optical path whereby illumination strikes said uniformly charged



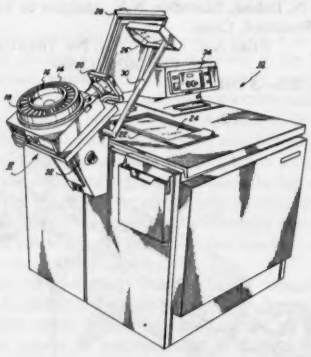
portion in an area adjacent the area struck by said light pattern, said illumination being sufficient to discharge said adjacent area, said specular reflector comprising a first set of planar surfaces each disposed at predetermined angles relative to said belt and a second set of planar surfaces each disposed at predetermined angles relative to said belt such that the planar surfaces of said first set are substantially perpendicular to lines which pass through a first reference point and said planar surfaces of said second set are substantially perpendicular to a plurality of lines all of which pass through a second reference point.

4,120,580

COLLATING SYSTEM FOR SLIDE REPRODUCTION

Louis D. Mailloux, Fairport, and James E. Bollman, Williamson, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 30, 1976, Ser. No. 701,447
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—14 **17 Claims**



1. An electrostatographic printing machine for reproducing a plurality of transparencies, including:

means for storing the transparencies in an operator selectable ordered sequence;

means for reproducing each one of the transparencies to form at least one set of copies thereof;

means, operatively associated with said storing means, for indexing automatically said storing means to advance successive transparencies into cummunication with said reproducing means to form copies thereof; and

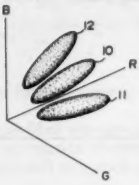
programming means, coupling said reproducing means with said storing means, for actuating said storing means in response to said reproducing means completing the copying of one of the transparencies to advance the next successive transparency into communication with said reproducing means to form a copy thereof.

4,120,581

APPARATUS FOR AUTOMATICALLY PRINTING COLOR PHOTOGRAPHS

Koji Takahashi; Taizo Akimoto; Shigeru Watanabe, and Takaaki Terashita, all of Minamiashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minamiashigara, Japan

Filed Jun. 22, 1977, Ser. No. 808,903
Claims priority, application Japan, Jun. 22, 1976, 51-73577
Int. Cl.[2] G03B *27/78, 27/32*
U.S. Cl. 355—38 **5 Claims**



1. Apparatus for automatically printing color photographs on color photographic papers from color originals comprising means for measuring the red, green and blue densities of a number of points in the original, means for determining if the points are of flesh color including (a) means for comparing the measured red, green and blue densities with a predetermined region corresponding to a reference flesh color and defined in a two or three dimensional coordinate system having the red, green and blue densities as the axes thereof, and (b) means for determining that the points are of flesh color when the measured densities are contained in said region, means for counting the number of the points which are determined as of flesh color, and means for controlling the exposure to print the original on the color photographic paper in such a color balance and density that the flesh color is reproduced in a desired color balance and density when the number of the points determined to be flesh color is more than a predetermined number.

4,120,582

LIGHT REFLECTIVITY AND TRANSMISSION TESTING APPARATUS AND METHOD

Martin De Vries; Harold A. Fitzgerald, II, both of Holland; Eldon J. Nyhof, Zeeland, and James D. van Putten, Jr., Holland, all of Mich., assignors to Donnelly Mirrors, Inc., Holland, Mich.

Filed Oct. 27, 1976, Ser. No. 736,251
Int. Cl.[2] G01N *21/48, 21/22*; G01J *1/04*
U.S. Cl. 356—73 **29 Claims**

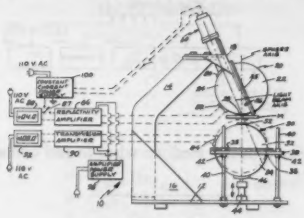
1. Apparatus for testing the light reflectivity and light transmission of an optical element or test sample such as a mirror or the like comprising:

first and second closed, hollow, light-integrating spheres aligned along a common axis, each sphere including a test aperture extending through its circumference, said test apertures being aligned with one another along said axis and intermediate the spheres when so aligned;

support means for supporting a test sample such as a mirror tightly against and between said spheres and immediately adjacent said test apertures and for clamping a test sample therebetween and sealing out ambient light from said spheres;

means for moving at least one of said spheres toward and away from the other for insertion of a test sample therebetween, said spheres being movable sufficiently close to one another so as to clamp said test sample tightly between said support means and seal out ambient light;

light source means for directing a beam of light at an angle to said axis through said first sphere, said test aperture in said first sphere, and against and at an angle other than normal to the surface of said test sample a predetermined area of which is exposed in said test aperture when said



test sample is supported by said support means, said beam being directed so as to pass through both test apertures and into said second sphere in the absence of a test sample between said spheres;

photo-detection means for detecting the total amount of reflected light in said first sphere and the total amount of transmitted light in said second sphere; and

means for separately indicating the total amounts of reflected and transmitted light, respectively, detected by said photo-detection means whereby the total light reflectivity and total light transmission of the said predetermined area of a test sample is simultaneously and instantaneously measured.

4,120,583

HIGH REGISTRATION PHOTOMASK METHOD AND APPARATUS

Gilbert P. Hyatt, P.O. Box 4584, Anaheim, Calif. 92803

Continuation-in-part of Ser. No. 101,881, Dec. 28, 1970, and Ser. No. 134,948, Apr. 19, 1971, and Ser. No. 135,040, Apr. 19, 1971, and Ser. No. 230,872, Mar. 1, 1972, and Ser. No. 232,459, Mar. 7, 1972, and Ser. No. 229,213, Apr. 13, 1972, Pat. No. 3,820,894, and Ser. No. 246,867, Apr. 24, 1972, and Ser. No. 288,247, Sep. 11, 1972, and Ser. No. 291,394, Sep. 22, 1972, and Ser. No. 302,771, Nov. 1, 1972, and Ser. No. 325,933, Jan. 22, 1973, Pat. No. 4,016,540, and Ser. No. 476,743, Jun. 5, 1974. This application Dec. 20, 1976, Ser. No. 752,751
Int. Cl.[2] G03B *27/04*
U.S. Cl. 355—86 **36 Claims**

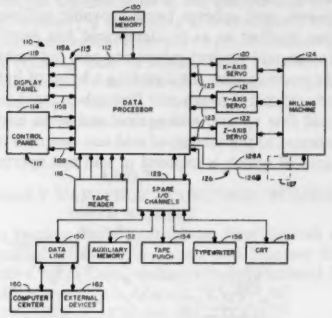
1. A contact exposure system for providing duplicate exposures of high registration images, said contact exposure system comprising:

master image means for providing high registration images to be duplicated, said master image means including a plurality of images having high registration therebetween;

an illumination sensitive medium for providing illumination exposures in response to an illuminated master image means;

contact exposure means for providing contact between said master image means and said illumination sensitive medium; and

illumination means for illuminating said master image means to provide an exposure of said master image means on said



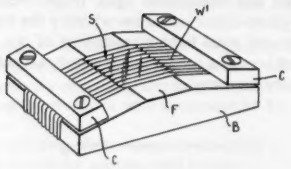
illumination sensitive medium when in said contact therebetween.

4,120,584

METHOD OF PREPARING SMALL SAMPLES INCLUDING LINISHING AN AREA OF THE SAMPLES

Raymond John Hodges, Churchill, and Charles Brian Belcher, Birmingham, both of Australia, assignors to Australian Wire Industries (Pty.) Limited, Melbourne, Australia

Filed Jun. 30, 1976, Ser. No. 701,178
Int. Cl.[2] G01N *1/00*
U.S. Cl. 356—36 **13 Claims**



1. A method of preparing small metal samples of a size normally too small for direct irradiation and excitation by an instrument for analysis by instrumental techniques, said method comprising the steps of holding a representative plurality of said samples in firm contact with a surface of a backing member, said plurality of said samples held in close proximity to each other and providing an area of said samples upon said surface, and linishing smooth the samples of said area across a surface parallel or tangential to said backing member surface to provide an analytical surface which is suitable for said instrumental analysis.

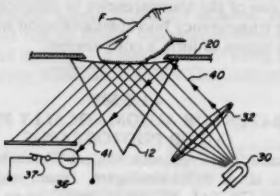
4,120,585

FINGERPRINT IDENTIFICATION SYSTEM USING A PLIABLE OPTICAL PRISM

Vito A. DePalma, Tonawanda, and Raymond W. King, Buffalo, both of N.Y., assignors to Calspan Corporation, Buffalo, N.Y.

Filed Nov. 19, 1976, Ser. No. 743,424
Int. Cl.[2] G06K *9/08*
U.S. Cl. 356—71 **3 Claims**

1. A fingerprint based identification terminal including:
sensor means;
optically clear, pliable, resilient prism means;
light source means for shining onto one internal surface of said prism means and being internally reflected onto said sensor means in accordance with the topographic configuration of any member contacting the external surface corresponding to said one internal surface and any resulting deformation of said one internal surface;
whereby when a finger contacts a planar surface of said prism means corresponding to said one internal surface, said planar surface and thereby said internal surface will



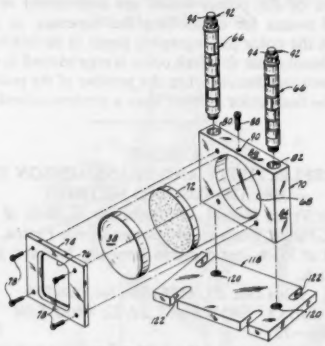
deform to partially mirror the ridge-valley configuration of the contacting finger to give a greater area of contact resulting in a high contrast image being reflected onto said sensor means due to absorption of light at said one internal surface where said planar surface is contacted by the finger.

4,120,586

METHOD AND MEANS FOR ALIGNING FOCUSING MIRRORS IN AN OPTICAL SPECTROMETER

David L. Lessner, Baltimore, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jan. 28, 1977, Ser. No. 763,383
Int. Cl.[2] G01J *3/18*; G02B *7/18*
U.S. Cl. 356—100 **12 Claims**

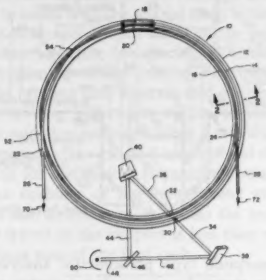


1. A means facilitating alignment of a focusing mirror which comprises a mirror mounting means for receiving a focusing mirror, radially expandable mounting means, said mirror mounting means having a bore for receipt of said radially expandable mounting means, a base plate, said radially expandable mounting means being attached to said base plate and providing rigid support in expanded condition for the mirror mounting means; and means for exerting a compressive force on said radially expandable mounting means.

4,120,587
DOUBLE OPTICAL FIBER WAVEGUIDE RING LASER GYROSCOPE

Victor Vali; Richard W. Shorthill, both of Salt Lake City, Utah; Raymond Goldstein, Pasadena, Calif., and Reuben S. Krogstad, Seattle, Wash., assignors to University of Utah Research Institute, Salt Lake City, Utah

Filed Nov. 24, 1975, Ser. No. 634,944
Int. Cl.[2] G01B 9/02
U.S. Cl. 356—106 LR 12 Claims

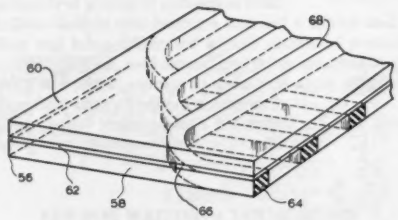


1. A laser apparatus for determining angular rotation of an area comprising:
- a double core optical fiber waveguide having a first and a second core, the waveguide circumscribing the area 360°;
- a gain medium interposed into each of the first and second cores;
- means for activating each gain medium to induce laser oscillation in each core;
- means in the first core for limiting laser oscillation in a clockwise direction and means in the second core for limiting laser oscillation in a counterclockwise direction;
- means for removing a portion of the laser oscillation radiation from each core;
- means for combining the portions of removed laser oscillation radiation, and
- means for detecting frequency differences between the laser oscillations.

4,120,588
MULTIPLE PATH CONFIGURATION FOR A LASER INTERFEROMETER

Erik Chaum, 4701 Caritina Dr., Tarzana, Calif. 91356

Filed Jul. 12, 1976, Ser. No. 704,444
Int. Cl.[2] G01B 9/02
U.S. Cl. 356—106 LR 14 Claims

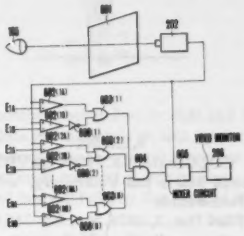


8. In an inertial rotational sensor, a waveguide transmission path comprising an ordered plurality of coupled waveguide loops in a first and second plane, each waveguide loop, at least partially circumscribing an area and having at least one crossing waveguide segment in said first plane crossing a waveguide segment of at least one other one of said plurality of waveguide loops in said second plane, said crossing waveguide segment being offset and isolated from said waveguide segment of said other one of said plurality of waveguide loops.

4,120,589
METHOD AND APPARATUS FOR MEASURING THE DISTRIBUTION OF A LIGHT FIELD ABOUT THE OPTICAL AXIS OF A LIGHT SOURCE

Yoshitada Mima, Tachikawa; Naoaki Kubushiro, Komae, and Koji Kojima, Kawasaki, all of Japan, assignors to Hitachi Denshi Kabushiki Kaisha and Kabushiki Kaisha Banzai, both of, Japan

Filed May 10, 1977, Ser. No. 795,532
Claims priority, application Japan, Jul. 2, 1976, 51/77726
Int. Cl.[2] G01J 1/00
U.S. Cl. 356—121 9 Claims

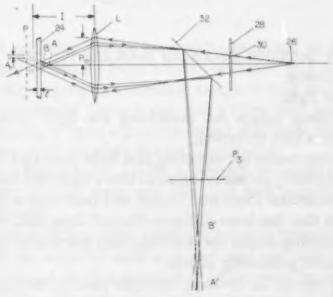


1. A method of measuring the distribution of light field about the optical axis of a light source comprising the steps of generating a video signal by picking up the light of said light source projected upon a screen, quantizing said video signal by means of a plurality of pairs of voltage comparators, each pair including voltage comparators set with different reference voltage levels, inverting one of the outputs of the voltage comparators of respective pairs in an orderly manner, synthesizing the one of the outputs of the respective pairs with the rest of the outputs thereof thus forming a dark and bright stripe signal, and displaying said stripe signal on a video display unit for producing a radially discrete annular pattern representative of equibrightness curves of the light distribution.

4,120,590
METHOD FOR MEASURING THE THICKNESS OF TRANSPARENT ARTICLES

Robert J. Bieringer, Toledo, and James A. Ringlien, Maumee, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Jun. 3, 1977, Ser. No. 803,000
Int. Cl.[2] G01B 11/00
U.S. Cl. 356—161 4 Claims



1. A method for measuring the thickness of transparent articles which comprises the steps of:

generating a plural component beam of light;

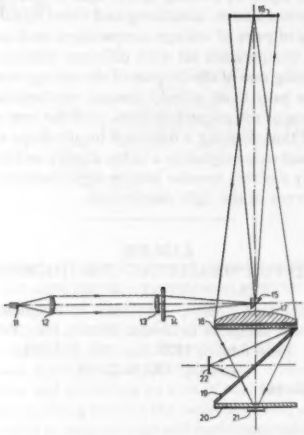
optically converging said plural component beam of light;
illuminating said transparent article with said convergent plural component beam of light thereby causing two separate reflections for all components of said plural component beam of light, one of said reflections representing reflection from the front surface of said transparent article and the other said reflections representing reflection from the rear surface of said transparent article;
projecting said reflections onto a detector plane which is conjugate to a plane in the vicinity of said article to thereby give two separate co-planar images of said plural component beam of light; and
measuring the average separation of said two separate images as an index of the thickness of said article at a point along the optic axis of the system.

4,120,591

COLOR DETECTION DEVICE

Ludovicus Petrus Maria van Valkenburg, 's-Prinsensingel 17, Maasland, Netherlands

Filed Dec. 1, 1976, Ser. No. 746,626
Claims priority, application Netherlands, Dec. 3, 1975, 7514061
Int. Cl.[2] G01J *3/46, 3/48*
U.S. Cl. 356—178 **4 Claims**



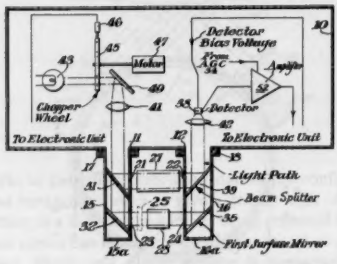
1. A color detection device for detecting the color of an object comprising:
a source of light;
first polarizing means for polarizing the light from said source in a first direction;
first directing means for directing said light onto said object;
second polarizing means oriented to block light that has been mirror-reflected from said object and pass only a part of the light that has been diffuse-reflected from said object;
second directing means for directing said portion of light to said second polarizing means;
a dividing mirror for dividing the light passing through said second polarizing means into a plurality of beams;
color filter means through which at least one of said beams pass; and
light detection means for producing signals proportional to the intensity of each of said beams.

4,120,592

MULTIPLEX OPTICAL ANALYZER APPARATUS

Sydney Winn Fleming, Wilmington, Del., and Gregory Paul Weeks, Waynesboro, Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 24, 1976, Ser. No. 670,079
Int. Cl.[2] G01N *21/24*
U.S. Cl. 356—201 **7 Claims**



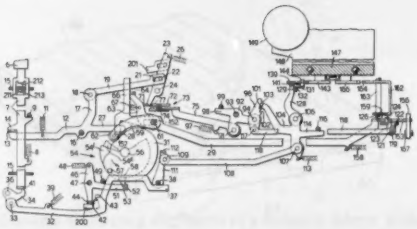
1. In an absorption type photometric analyzer having a radiation source, means for sequencing radiation wavelengths, radiation collimating means and a radiation detector operating in synchronization with the means for sequencing radiation wavelengths, a radiation routing apparatus receiving analytical radiation from said radiation collimating means comprising:
means for splitting said analytical radiation into first and second beams of preselected wavelength bands and for reflecting said first beam of preselected wavelength band through a first sample cell disposed athwart said first beam of preselected wavelength band of radiation to form a first beam of emergent radiation, and for transmitting said second beam of preselected wavelength band through a second sample cell disposed athwart said second beam of preselected wavelength band of radiation to form a second beam of emergent radiation; and
means for merging the first and second beams of emergent radiation along a coincident path to said detector.

4,120,593

LINE-SPACING SYSTEM FOR PRINTING OFFICE MACHINES

Domenico Roano, Parella, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Jun. 17, 1976, Ser. No. 697,180
Claims priority, application Italy, Jun. 23, 1975, 68607 A/75
Int. Cl.[2] B41J *19/90*
U.S. Cl. 400—549 **6 Claims**



1. In a printing office machine of the type having a carriage, a controllable line spacing mechanism and a controllable carriage return mechanism for returning the carriage to the beginning of the printing line, comprising:
actuatable control means for enabling both the line spacing mechanism and the carriage return mechanism;
means for actuating said control means to effect both the line

spacing and the return of the carriage to the beginning of the printing line;

manually actuatable stop means for preventing the movement of the carriage to override said carriage return mechanism; and

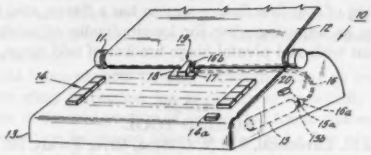
means for manually actuating both the control means and the stop means to effect the line spacing of the carriage without the return of the carriage to the beginning of the printing line, wherein the forward shifting of the carriage is effected by an escapement tooth coacting with a first rack of the carriage and wherein said stop means includes a second rack disposed on the carriage and a detent configured to coact with the second rack, wherein said detent is disposed in correspondence with the printing point of the machine to enable line-spacing without carriage return to the beginning of the printing line from any position along the printing line, wherein said control means effects the line-spacing before the return of the carriage and wherein said stop means includes a movable support slidably disposed relative to said carriage and shifted together therewith for disenabling the carriage return mechanism after the enabling of the line spacing mechanism, and wherein said detent is mounted on the movable support and the travel of the support is less than or equal to the escapement step of the first rack.

4,120,594

CORRECTION DEVICE FOR TYPEWRITERS AND THE LIKE

Robert Howard, Windham, N.H., assignor to Centronics Data Computer Corp., Hudson, N.H.

Filed Feb. 4, 1977, Ser. No. 765,627
Int. Cl.[2] B41J *29/36*
U.S. Cl. 400—697 **2 Claims**



1. Apparatus for applying characters to a sheet of paper, including means for correcting errors, said apparatus including:

supporting means comprising a platen for supporting a sheet of paper;

printing means mounted for movement adjacent to said supporting means for selectively applying characters to said sheet of paper;

a pressurized source of correction fluid;

a hollow flexible tube having a first and a second end, said first end being connected to said source of pressurized correction fluid, said second end being mounted to move with said printing means to selectively apply said correction fluid to said sheet of paper; and

coiling means responsive to movement of said printing means for coiling said hollow flexible tube.

4,120,595

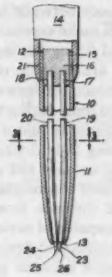
PEN FOR WRITING A DOUBLE LINE

Joseph A. Moreno, P.O. Box 568, Saegertown, Pa. 16433

Filed Dec. 10, 1976, Ser. No. 749,449
Int. Cl.[2] B43K *27/04, 27/08*
U.S. Cl. 401—35 **6 Claims**

1. A writing instrument comprising a hollow body open at one end with two elongated flexible members inside said body and rigidly secured thereto at their ends remote from said open end and extending substantially to said open end, in engagement with each other and in engagement with said body around said open end,

writing means on the outer ends of said flexible members, extending from said open end,



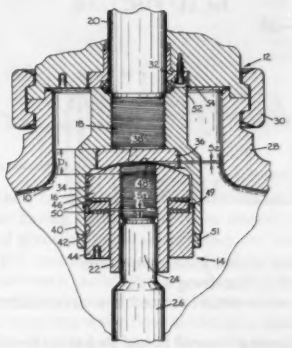
said flexible members being free to slide and twist on each other and slide on said body at said open end, whereby said writing ends engage a writing surface and describe two lines that cross each other irrespective of the position in which said body is held by the hand of the writer.

4,120,596

VALVE-ACTUATOR COUPLING

Timothy Edward Kunkle, Pittsburgh, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Mar. 4, 1976, Ser. No. 663,786
Int. Cl.[2] F16K *41/00*; F16B *7/18*
U.S. Cl. 403—14 **1 Claim**



1. A coupling device for a valve stem and an actuator rod operably extending from a valve actuator, said stem and said rod being aligned on a common axis, said stem being capable of axial movement toward and away from said actuator while maintaining at least a predetermined minimum distance therebetween, said coupling device comprising:

a first fitting being axially adjustably mounted on an end of one of said stem and said rod and including a cavity therein;

a second fitting being axially adjustably mounted on an end of the other of said stem and said rod and including an enlarged portion adapted to be loosely fitted within said cavity allowing some axial movement of said enlarged portion with respect to said first fitting;

said first and said second fittings respectively having aligned first surfaces thereon which are generally perpendicular to said axis, said first surfaces making contact during

movement of said rod in a direction away from said actuator;

spring means disposed within said cavity of said first fitting between said first fitting and said second fitting and capable of limited resilient deflection while exerting a force on said first and said second fittings in a direction tending to decrease an axial distance between said stem and said rod until said first surfaces make contact;

said first and said second fitting having aligned second surfaces thereon which are capable of making contact to maintain said axial distance between said stem and said rod within a predetermined limit during movement of said rod in a direction toward said actuator and to prevent said spring means from being fully deflected;

locating means mounted on said rod and adapted to make contact with said actuator for maintaining said end of said rod at least a desired distance from said actuator, said locating means being capable of preselected axial positioning on said rod to establish said desired distance for maintaining said axial distance between said stem and said rod less than said predetermined limit when said stem and said rod are positioned toward said actuator; and

said first fitting having an opening therein to allow viewing of said cavity and said spring means to facilitate some deflection of said spring means when establishing said desired distance of said end of said rod from said actuator by axial adjustment of said first fitting, said second fitting and said locating means.

4,120,597

BALL JOINT

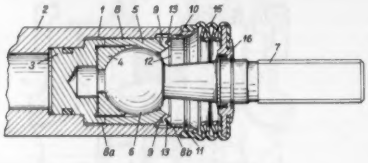
Barry John Millard, Reading, England, assignor to Adwest Engineering Limited, Great Britain

Filed Feb. 28, 1977, Ser. No. 772,903

Claims priority, application United Kingdom, Mar. 2, 1976, 8327/76

Int. Cl.[2] F16C *11/06*

U.S. Cl. 403—24 **25 Claims**



1. A ball and socket joint comprising:

(a) a socket for receiving a ball;

(b) a first screw thread formed in a circumferential wall of the socket;

(c) a ball housing secured in said socket in threaded engagement with said first screw thread for retaining a ball in the socket;

(d) a second screw thread formed in the circumferential wall of the docket at a location outwardly from said first screw thread toward the mouth of the socket; the second screw thread being of opposite hand to said first screw thread and being of larger diameter than said first screw thread so that the ball housing can pass therethrough into threaded engagement with said first screw thread;

(e) an annular locking member secured to said socket in threaded engagement with said second screw thread and in retaining abutting relationship with said ball housing;

(f) at least one recess in the ball housing abutted by said annular locking member; and

(g) a radially inwardly directed portion formed on said annular locking member which is deformed axially into said at least one recess in the ball housing to prevent relative rotation between the locking member and the ball housing.

4,120,598

ASSEMBLY FIXTURE FOR FURNITURE

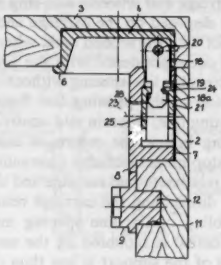
Ernst Zernig, Hemer, and Manfred Rüther, Nachrodt, both of Fed. Rep. of Germany, assignors to Firma Richard Heinze GmbH & Co. KG, Herford, Fed. Rep. of Germany

Filed Sep. 13, 1976, Ser. No. 722,959

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1975, 2541554

Int. Cl.[2] F16B *12/50*

U.S. Cl. 403—68 **14 Claims**



1. In an assembly fixture for furniture of the type comprising a first fixture section containing a casing that can be embedded in an associated first furniture part, and a second fixture section adapted to be fastened to an associated second furniture part and arranged to cooperate with said first fixture section for attaching said first and second furniture parts to one another, said furniture including a door having a hinge attached thereto, said hinge having a pivotal hinge bracket adapted to be attached to said first furniture part for pivotally supporting said door from said first furniture part, the improvement wherein the casing of said first fixture section has a flange, said flange carrying an adjusting plate for longitudinally adjustable engagement with said pivotal hinge bracket of said hinge.

4,120,599

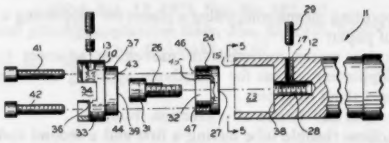
BORING TOOL

Norman H. Lovendahl, 814 N. Clinton, River Forest, Ill. 60305

Filed May 4, 1977, Ser. No. 793,612

Int. Cl.[2] B23B *51/00*

U.S. Cl. 408—150 **8 Claims**



1. An improved boring tool, said boring tool comprising:

a main shaft;

said main shaft having a longitudinal axis;

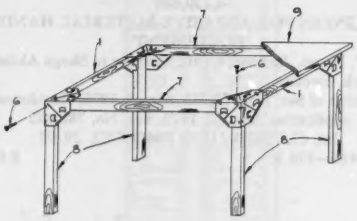
eccentric means at one end of said main tool shaft being radially eccentric relative to the said longitudinal axis;

tool holder means holding a cutting tool for boring purposes;

locking means for locking said tool holder to said shaft so as to prevent movement of said tool holder axially and radially relative to said shaft, whereby chatter is prevented; and

collar means including said locking means coupled to said tool holder means and rotatably mounted in said eccentric means to enable said tool holder means to continuously rotate through 360 degrees, thereby continuously varying the distance from the edge of the cutting tool to the axis of said shaft as said tool holder means is rotated.

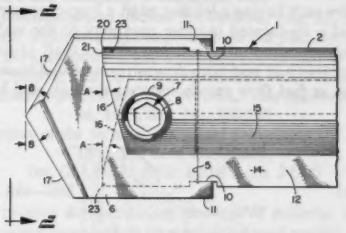
4,120,600
CORNER BRACKET
Gordon H. Rees, 1650 Fillmore Ave., Buffalo, N.Y. 14211
Filed Apr. 12, 1976, Ser. No. 676,284
Int. Cl.[2] F16B 7/00
U.S. Cl. 403—231 7 Claims



1. A corner construction bracket for three dimensional frames comprising:
(a) a unitary member having three mutually perpendicularly related planar sides, said member being relatively strong and stiff and being formed of a relatively rigid, yet at least somewhat resilient material, adjacent faces of said sides forming an interior surface,
(b) each said side being rigidly affixed edgewise to each of the other two sides,
(c) means on each said side other than separate fastening means for guiding an end portion of at least one frame element of a selected size into proper position in said bracket, said means also both biasing said end portion against one adjacent side and holding it substantially parallel to said side simultaneously
(d) each said side also including suitably positioned holes for receiving fasteners for fastening said bracket to said frame elements,
(e) said frame element holding means including an inwardly extending projection for engaging an outwardly facing side of the end portion of an inserted frame element, said projection having an attached edge and a free edge, said projection being relatively elongated and positioned in spaced, parallel relation to said one adjacent side, said spacing being substantially equal to one dimension of said selected size,
(f) said projection spacing being at least somewhat adjustable by bending said projection to accommodate minor variations in the size of the frame elements from said selected size, whereby three frame elements may be inserted into said bracket and held in mutually perpendicular relation pending the insertion of separate fasteners.

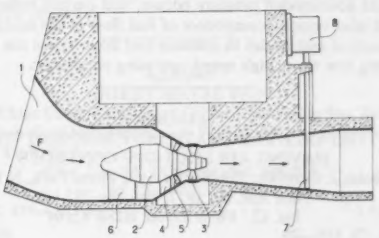
4,120,601
SPADE DRILL
Milton L. Benjamin, Chagrin Falls, Ohio, assignor to Erickson Tool Company, Solon, Ohio
Filed Oct. 6, 1977, Ser. No. 839,923
Int. Cl.[2] B23B 31/44, 51/00
U.S. Cl. 408—226 5 Claims

1. In a spade drill wherein a holder has a slot diametrically across one end thereof, and a blade having cutting edges forming an obtuse angle cutting point is clamped in said slot by screw means with its cutting edges disposed axially forwardly of the open end of said slot and with its other end in abutting engagement with the bottom of said slot, the improvement which comprises oppositely beveled end surfaces on said holder which are perpendicular to the opposite side faces of the blade and which respectively extend angularly from near the axially forward corner of the slot at an angle less than the angle of the respective cutting edges to define convergent passages of right angle cross section for tracking the flow of



chips toward diametrically opposite obtuse angle longitudinal grooves in said holder.

4,120,602
METHOD AND APPARATUS FOR CONTROLLING A WATER TURBINE
Lucien Megnint, Grenoble, France, assignor to Neyrpic - Creusot Loire, Grenoble and Compagnie Nationale du Rhone, Lyons, both of, France
Filed Jan. 3, 1977, Ser. No. 757,796
Claims priority, application France, Jan. 6, 1976, 76 00154
Int. Cl.[2] F01D 17/00
U.S. Cl. 415—1 2 Claims

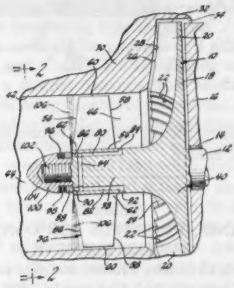


1. A method of controlling the operation of a bulb type water turbine having a mobile guide vane assembly comprising a plurality of pivotable guide vanes which are short and noncontiguous and constitute a circumferential array in juxtaposition to a stationary conical front guide vane assembly and downstream thereof, a water turbine disposed downstream of said bulb for receiving water flow discharging from said pivotable guide vanes and a gate sluice downstream of said turbine for closing off flow through an annular duct carrying said bulb, said mobile guide vane assembly and said stationary guide vane assembly, said method comprising the steps of:
limiting the angular play of the pivotable guide vanes during turbine operation to cause said mobile guide vane assembly to only, variably deflect the water during turbine operation and
employing the gate sluice for controlling the starting and stopping of the turbine and water-tight sealing of the turbine when the turbine is stopped.

4,120,603
JET FLAP CONTROLLED FUEL PUMP
Noel L. Downing, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Mar. 28, 1977, Ser. No. 781,701
Int. Cl.[2] F04D 17/00
U.S. Cl. 415—11 3 Claims

1. A fluid flow inducer for supplying inlet fuel flow to a high

speed centrifugal pump comprising a housing with a bore therein, a rotating shaft driven by the centrifugal pump located concentrically within said bore, a conoidally configured inlet nose on said shaft, a plurality of circumferentially spaced inducer blades each having a leading edge, a base connected to said shaft and a tip located in close proximity to the wall of said bore and operative upon rotation of said shaft to produce a higher pressure in said bore downstream of said blades which increases as fuel flow rate is reduced through said bore, and



means on said shaft including a valve responsive to pressure in said bore downstream of said blades and an outlet from said shaft closely adjacent said leading edge to produce a radially outwardly directed curtain of fuel slung from said rotating shaft immediately upstream of said blades when a predetermined downstream pressure occurs, said curtain reducing the axial inlet velocity component of fuel flow at the leading edge of each of said blades to stabilize fuel flow across the inducer during low flow, high speed operating conditions.

4,120,604

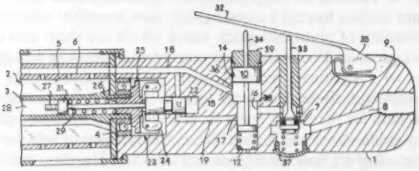
PORTABLE PNEUMATIC NUT RUNNING TOOL HAVING AIR SHUT-OFF CONTROLS

Nicholas J. Garofalo, 259-09 81st Ave., Floral Park, N.Y. 11004

Filed Apr. 29, 1977, Ser. No. 792,147

Int. Cl.[2] F01B *25/00*; B23B *45/04*

U.S. Cl. 415—25 **10 Claims**



1. A portable pneumatic nut running tool comprising an air driven torque transmitting motor, a primary and a secondary air feed passage connecting with the motor, a throttle valve operable from a closed normal position to an open position to feed operating air to both the primary and secondary passages, a shiftable control valve normally blocking the secondary passage to flow of operating air to the motor, centrifugally operable means responsive to acceleration of the motor to shift the control valve to open the secondary passage to flow of operating air to the motor, a blocking valve movable from an open normal position to a position blocking the primary passage to flow of operating air to the motor, manipulative lever means movable through an initial angle to open the throttle valve and movable through a further angle to move the blocking valve to its position blocking the primary passage, spring means responsive to a predetermined degree of deceleration of the motor to return the control valve to its position blocking the secondary passage, and return spring means responsive to manual release of the lever means to return the throttle and blocking valves to normal.

4,120,605

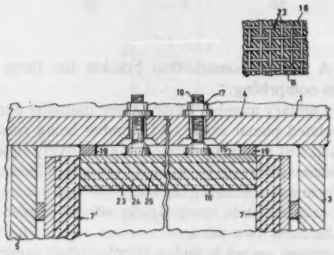
WEAR LINERS FOR ABRASIVE-MATERIAL HANDLING EQUIPMENT

George P. Hurst, Jackson, Calif., assignor to Skega Aktiebolag, Ersmark, Sweden

Continuation of Ser. No. 575,773, May 9, 1975, abandoned. This application Apr. 18, 1977, Ser. No. 788,195

Int. Cl.[2] F03B *11/00*; F04D *7/02, 29/02*

U.S. Cl. 415—170 R **8 Claims**



1. A liner for a centrifugal pump for pumping abrasive material, which pump includes an impeller between the opposed sidewalls of a case having a volute surrounding said impeller and extending to the pump outlet, comprising:

(a) a volute-shaped liner of rubber adapted to be positioned within and to follow said volute having a generally radially inwardly facing wear surface for engagement with the abrasive material pumped by said pump when said liner is within said volute and the impeller is operating;

(b) a sheet of abrasive resistant wire mesh embedded within said liner disposed parallel with said wear surface providing a mesh surface for resisting wear from abrasion upon such wear of said liner to said mesh surface;

(c) the rubber of said layer being vulcanized and substantially inseparably bonded to the wires of said sheet and;

(d) said sheet of abrasive resistant wire mesh being located closer to said wear surface of said layer when said layer is installed in said apparatus than to the opposite surface of said layer.

4,120,696

SUBMERSIBLE MOTOR PUMP

Karl Reiss, Limbach, Fed. Rep. of Germany, assignor to Klein, Schanzlin & Becker Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 12, 1976, Ser. No. 731,335

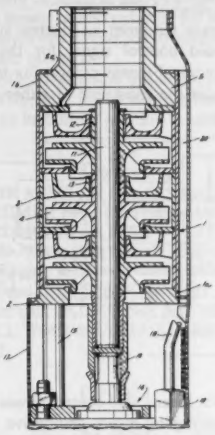
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1975, 2548584

Int. Cl.[2] F04D *29/44*

U.S. Cl. 415—199.1 **9 Claims**

1. In a submersible motor pump, a combination comprising a tubular pump housing having first and second end portions; fluid conveying means including at least one stage in said housing, said stage having a casing; first and second compressing members respectively extending into said first and second end portions; and first and second connecting means for permanently securing said first and second compressing members to the respective end portions at such a distance from each other that said casing is subjected to axial stresses, said casing

consisting of deformable material and bearing against the internal surface of said housing as a result of said axial stresses with



a force which suffices to invariably prevent any movements of said casing relative to said housing.

4,120,607

ROTOR BLADE FOR A GAS TURBINE ENGINE

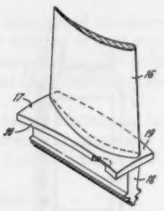
John Frederick Coplin, Duffield, England, assignor to Rolls-Royce Limited, London, England

Filed Mar. 16, 1977, Ser. No. 778,170

Claims priority, application United Kingdom, Mar. 26, 1976, 12278/76

Int. Cl.[2] F01D *5/30*

U.S. Cl. 416—2 **7 Claims**



1. A rotor assembly for a gas turbine engine comprising: a casing; a rotor mounted within said casing and having a plurality of rotor blades assembled thereon and defining at least one blade row; a containment ring carried by said casing outward of said at least one blade row, said containment ring being sufficiently strong to withstand impact of one of said blades; and each of said blades having an aerofoil portion with a convex flank and a concave flank, an inner platform having opposed edges arranged to abut against corresponding edges of adjacent platforms when said blades are assembled on said rotor, a root portion of reduced thickness relative to said platform at a point of attachment to said platform, and one of said edges lying adjacent to said convex flank of said aerofoil portion having an indentation formed thereon with one wall facing backwards at an angle less than 90° to said one edge whereby if said aerofoil portion and said platform becomes detached from said root portion and/or said rotor, motion of said aerofoil portion and said platform will be contained by engagement between said indentation on said platform and a leading edge of a next adjacent blade in said at least one blade row.

4,120,608

HEAT-STABLE POLYMER COATING COMPOSITION WITH ANTIOXIDANT

Eustathios Vassiliou, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 606,298, Aug. 22, 1975, abandoned, which is a continuation-in-part of Ser. No. 509,938, Sep. 27, 1974, abandoned, and a continuation-in-part of Ser. No. 552,870, Feb. 25, 1975, abandoned, which is a continuation-in-part of Ser. No. 509,938,. This application Mar. 24, 1977, Ser. No. 780,905

The portion of the term of this patent subsequent to Oct. 18, 1994, has been disclaimed.

Int. Cl.[2] B05D *3/02;* **B32B** *3/10, 27/00*

U.S. Cl. 428—187 **11 Claims**

1. A process for producing decorative patterns within a baked coating composition on a substrate, said coating composition consisting essentially of

(a) heat-stable polymer stable at temperatures above 300° C.,

(b) colorant,

(c) antioxidant, and

(d) liquid carrier;

said process consisting essentially of applying the composition either as a subsequent coat over or directly under an oxidation catalyst composition which is arranged in a decorative pattern on a substrate, and then baking the coating; wherein said oxidation catalyst or its decomposition products diffuse into the coating and catalyze oxidation of the colorant, thereby rendering, upon baking, the decorative pattern visible within the heat-stable polymer coating.

11. An article bearing a baked coating produced by the process of claim 1.

4,120,609

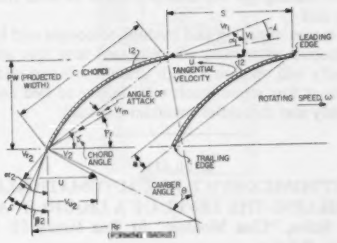
SHEET METAL FAN

Cheng-Chien Chou, Carmel, and Clifford Sau Leong Yee, Indianapolis, both of Ind., assignors to Wallace Murray Corporation, New York, N.Y.

Filed Jun. 14, 1976, Ser. No. 695,818

Int. Cl.[2] F04D *29/38*

U.S. Cl. 416—223 R **1 Claim**



1. A rotating fan comprising, in combination:

(a) a hub secured to and rotated by a rotary shaft;

(b) a plurality of sheet metal fan blades fixed in spaced circumferential relation to said hub and projecting radially therefrom; each fan blade having a leading edge and a trailing edge defining a chord length C therebetween, and a forming radius of curvature at each radial station r which establishes with said chord length C a camber angle θ and a chord angle γ at each such station; and each fan blade having its chord angle and its camber angle varied over its radial length such that the theoretical energy transfer ΔH_{TH} per unit mass of air at each radial station r is equal to $K_H(r^N)$ over at least 70% of its radial length, where n is a constant greater than 1 but less than 2 and

$$K_H = \left(\frac{\Delta p}{\rho g}\right)\left(\frac{1}{\eta_{oa}}\right)\frac{(n+2)(r_o^2 - r_i^2)}{2[r_o^{(n+2)} - r_i^{(n+2)}]}$$

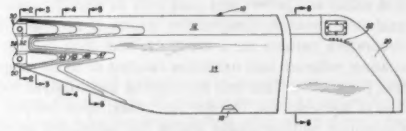
in which:
ρ = density of air
r_i = fan blade inner radius
r_o = fan blade outer radius
Δp = average pressure rise across the fan
η_{oa} = overall fan efficiency
g = gravitational acceleration.

4,120,610

HELICOPTER BLADE STRUCTURE

James L. Braswell; Cecil E. Covington, both of Hurst; Nolan B. Phillips, Forth Worth, and David E. Snyder, Arlington, all of Tex., assignors to Textron, Inc., Providence, R.I.

Filed May 16, 1974, Ser. No. 470,520
Int. Cl.[2] B64C *27/48*
U.S. Cl. 416—226 **11 Claims**



1. A helicopter blade comprising:
(a) an elongated metallic nose spar having a closure member therefor to form a nose spar assembly of material having a high modulus of elasticity and having upper and lower trailing flanges closed by said member with a coupling bushing directly connected to said assembly for direct transfer of primary loads from said spar to said bushing,
(b) a trailing skin structure attached to and supported from said nose spar assembly,
(c) bands of unidirectional fiberglass material having a lower modulus of elasticity than said assembly and extending the length of the blade and bonded to the upper and lower interior surfaces of said nose spar assembly with a loop formed at the root of said blade by said bands and attached to said bushing for secondary transfer of load from said blade, and
(d) grip means engaging said bushing to couple said blade to a helicopter rotor mast whereby said nose spar assembly normally will operate at high strain levels and said bands operate at low strain levels until failure of said nose spar assembly and thereafter maintain the load.

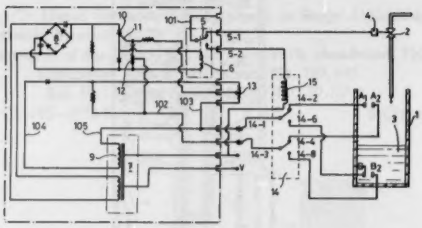
4,120,611

ELECTRONIC DEVICE FOR AUTOMATICALLY CONTROLLING THE LEVEL OF A LIQUID IN A VAT

Roger M. Salve, "Clos Monfort" 51 Rue Haute 51, B-1330 Rixensart, Belgium

Filed Apr. 7, 1977, Ser. No. 785,751
Int. Cl.[2] F04B *49/06*; H01H *35/18*
U.S. Cl. 417—36 **3 Claims**

1. An electronic device for automatically controlling the level of a liquid in a vat fed with the liquid through pump means, said electronic device comprising in combination:
(a) first resistor means placed at a relatively higher level on the inner wall surface of the vat, said resistor means having a resistance which is variable in response to the presence or absence of the liquid at the position thereof;
(b) second resistor means placed at a relatively lower level on the inner wall surface of the vat, said resistor means having a resistance which is variable in response to the presence or absence of the liquid at the position thereof;
(c) first switching means responsive to a control signal for being switched from a first to a second state, the first state being effective to enable the operation of the feed pump means for the liquid, whereby the switching of said first switching means to its second state causes the feed pump means to be stopped,
(d) control means fed from an electric supply source for producing said control signal for the first switching means, said control means comprising impedance means which includes the resistance of either of said first and



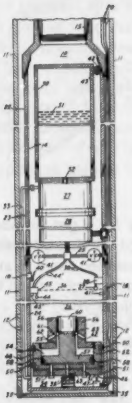
second resistor means, said control means further comprising second switching means responsive to an energizing signal for being switched from a first to a second state, said first state being effective for connection across the first resistor means and said second state being effective for connection across the second resistor means, the said energizing signal for the second switching means being produced in response to the first switching means being operated to its second state.

4,120,612

AUTOMATIC PUMP FOR DEEP WELLS

Kenard D. Brown, 1227 S. Willow St., Casper, Wyo. 82601

Filed Jan. 22, 1976, Ser. No. 651,512
Int. Cl.[2] F04B *9/10*
U.S. Cl. 417—53 **16 Claims**



1. In a deep well pump assembly of the type including an upwardly extending cylinder having therein a reciprocating piston for receiving liquid from a reservoir formation and delivering liquid to the surface and means for actuating the piston dependent upon the accumulation of a predetermined quantity of liquid in said cylinder above the piston, the improvement which comprises:
means including a hydraulic pump mounted in said assembly and having its outlet connected to deliver liquid to said cylinder below said piston for driving said piston upwardly in said cylinder to discharge fluid from said cylin-

der, said cylinder below said piston constituting an expansible chamber,

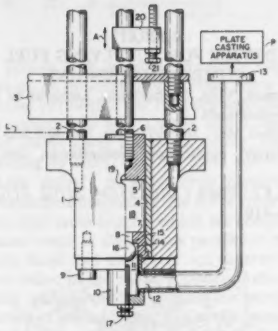
said means dependent upon the accumulation of a predetermined quantity of liquid in said cylinder above said piston including a sensor in said cylinder for detecting the level of liquid therein and connected to initiate the operation of said hydraulic pump, and

means actuated by said piston at the upper end of its stroke and controlling said piston driving means for returning said piston to its bottom position in said cylinder.

4,120,613
PUMP FOR MOLTEN LEAD, PARTICULARLY INJECTION PUMP USED IN THE MANUFACTURE OF STORAGE BATTERY PLATES

Kurt Kürvers, and Johann König, both Büddingen, Fed. Rep. of Germany, assignors to Accumulatorenfabrik Sonnenschein GmbH, Büddingen, Fed. Rep. of Germany

Filed Jan. 25, 1977, Ser. No. 762,327
Int. Cl.[2] F04B *39/10, 39/12;* **C21D** *1/06*
U.S. Cl. 417—53 **15 Claims**



15. In the art of casting lead structures, a method of making structural elements defining at least portions of a pump chamber of a pump to pump molten lead, said pump having a housing structure element **(1, 4)** defining at least a portion of a pump chamber **(18)**;

means **(19)** introducing molten lead into the pump chamber;

and a pump element **(5)** located in the housing structure element **(1, 4)** forming a surface defining the pump chamber

comprising the steps of

high-pressure permanent mold casting said elements of a cast iron having a lamellar graphite structure;

nitriding said castings in a bath of molten cyanides and cyanates at a temperature of from 500° to 600° C. for a period of at least ½ hour;

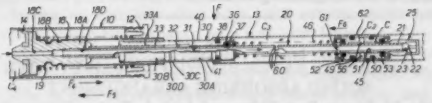
and thereafter cooling said castings in air to room temperature.

4,120,614
HAND BICYCLE PUMP WITH PRESSURE PRESELECTION AND DISPLAY MEANS

Paul C. Bouder, Soisy-sous-Montmorency, France, assignor to Etablissements Poutrait-Morin S.A., Aubervilliers, France

Filed Jul. 27, 1977, Ser. No. 819,678
Claims priority, application France, Jul. 30, 1976, 76 23309; Jun. 9, 1977, 77 17631
Int. Cl.[2] F04B *21/00, 49/00;* **F16K** *15/20*
U.S. Cl. 417—63 **20 Claims**

1. A hand bicycle pump generally of elongate cylindrical configuration comprising a pump rod mounting a compression piston and a pump body having air inlet means and displaceable along said pump rod and defining a compression chamber with said compression piston, an air circulation tube disposed inside said pump rod and communicating at one end with said compression chamber and at the other end with means for temporarily coupling said pump to an inflatable body, pressure preselection and display means accommodated in said pump rod around said air circulation tube and accessible from outside said pump, said pressure preselection and display means adapted to vary the spring force of spring means normally biasing a piston control member towards its inflating position, said piston control member adapted to be in communication

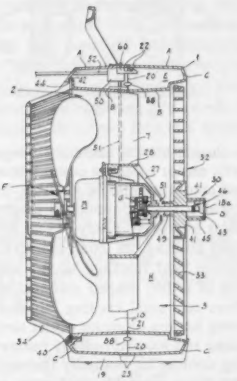


with the pressure inside the inflatable body through said coupling means, whereby in response to pressure in the inflatable body exceeding said preselected pressure said piston control member is urged away from its inflation position against the biasing force of said spring means, and valve means responsive to displacements of said piston control member for bringing said compression chamber into communication with the atmosphere when the pressure inside the inflatable body exceeds the preselected pressure.

4,120,615
BOX FANS

Phillip William Keem, North Croydon; Laimons Kaimins, Forest Hill, and James Graham, Eltham, all of Australia, assignors to Allware Agencies Limited, London, England

Filed Feb. 4, 1977, Ser. No. 765,628
Int. Cl.[2] F04B *39/02*
U.S. Cl. 417—360 **9 Claims**



1. A box fan comprising a box-like structure containing an electric motor and a fan blade assembly operable by the motor, which structure consists of a front section and a rear section forming a box having front and rear openings which are interconnected to form a duct through said box, the fan blade assembly being positioned for causing air flow through the duct when the motor is operating, wherein the two sections are held securely together by a locking means including external resiliently operable disguised clamps which are disposed transversely of the interface between said sections, said locking means further including an interlocking means, elements of which include the combination of an interfacial edge on a first of the sections; a tongue adjacent the edge and interiorly of said first section, said tongue terminating in a hooked portion and extending beyond the adjacent interfacial edge; an interfacial edge on the second of the sections opposing that of the

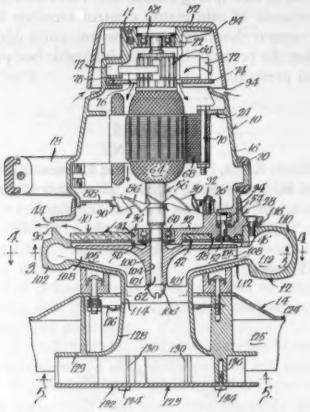
first; and a hooked portion adjacent the interfacial edge of the second section and interiorly of said second section and located in alignment with said tongue and cooperating to engagingly receive the tongue hooked portion when the two sections are assembled by first being pivoted about an axis formed by joining the interfacial edges adjacent the cooperating hooked portions to provide leverage for engaging said hooked portions upon swinging the sections together to complete the assembly of the box, said clamps being positioned at a side of the box opposite that of said interlocking means to retain the engagement of the cooperating elements.

4,120,616

VACUUM CLEANER-BLOWER ASSEMBLY WITH SOUND ABSORBING ARRANGEMENT

Niles M. Dwyer, Park Ridge, and Janis A. Rasins, Chicago, both of Ill., assignors to Breuer Electric Manufacturing Company, Chicago, Ill.

Filed Oct. 6, 1975, Ser. No. 619,790
Int. Cl.[2] F04B *35/04, 39/06;* F04D *29/44*
U.S. Cl. 417—373 **7 Claims**



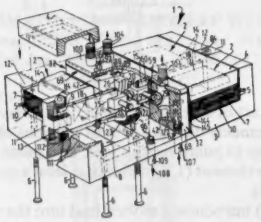
1. A vacuum cleaner-blower assembly comprising, in combination, an electric motor having a commutator assembly adjacent one end and an output shaft at its other end, a housing for said motor enclosing said commutator assembly and having elongate inlet slots on the periphery of said housing for admission of air to said housing, an axial vane cooling fan on said output shaft within said housing, sound absorbing material consisting solely of a disc shaped mat juxtaposed in the discharge flow from said axial cooling fan and normal to said shaft, said housing having elongate outlet slots on the periphery of said housing and located radially outwardly of said mat, said fan drawing cooling air inwardly through said inlet slots, over said commutator assembly and over and through the motor, impinging the air generally perpendicularly against said sound absorbing mat and discharging the air outwardly through said outlet slots; an impeller on said output shaft outwardly of said motor housing, a casing and a support disc enclosing said impeller, said casing being connected to said motor housing, said sound absorbing material lying against said support disc, said sound absorbing material having an opening for said output shaft, said support disc supporting said sound absorbing material and being located adjacent said impeller, said impeller comprising a plurality of curved vanes facing radially and axially away from said motor and each comprising an inner portion curved forwardly in the direction of impeller rotation and an outer or tip portion curved rearwardly relative to the direction of impeller rotation, said inner portions projecting axially beyond said tip portions in the direction away from said motor, said casing including a tubular inlet chamber surrounding the axially extending portions of the inner portions of said vanes, a generally transverse wall paralleling and enclosing the tip portions of said vanes and an exhaust chamber surrounding the outer periphery of said vanes, said exhaust chamber comprising a volute chamber of linearly increasing cross-sectional area leading to a generally tangential outlet; said impeller upon energization of said motor rotating within said casing to draw fluid at high vacuum pressure axially into said tubular inlet chamber, to discharge the fluid without turbulence radially into said volute chamber and to discharge the fluid through said tangential outlet; whereby the assembly provides a vacuum connection at said tubular inlet chamber and a blower connection at said tangential outlet and produces substantial fluid force and volume of flow with minimal cooling fan and impeller noise and power consumption.

4,120,617

PUMP DEVICE FOR SUPPLYING FUEL TO A COMBUSTION ENGINE

Willem Brinkman, Velp, Netherlands, assignor to Holec N.V., Hengelo, Netherlands

Filed Mar. 10, 1976, Ser. No. 665,533
Claims priority, application Netherlands, Jan. 21, 1976, 7600624
Int. Cl.[2] F04B *17/00, 35/04, 21/02, 21/04*
U.S. Cl. 417—410 **26 Claims**



1. In a device for supplying fuel to an atomizer of a combustion engine, a housing having a cylinder therein, a coupling member having an abutment member, a displacer body slidably received in said cylinder and defining a pump chamber therewith, said displacer body being connected to said coupling member in offset relation to said abutment member, drive means for moving said coupling member back and forth to reciprocate said displacer body within said cylinder, rigid stop means for engagement by said abutment member to limit movement of said coupling member, and thereby control the stroke of said displacer body, inlet valve means for allowing fuel to flow into said pump chamber as said displacer body moves in that direction increasing the volume of said chamber, and outlet valve means for allowing fuel to flow out of said pump chamber when the displacer body is moved in the opposite direction to decrease the volume of said pump chamber, the improvement wherein:

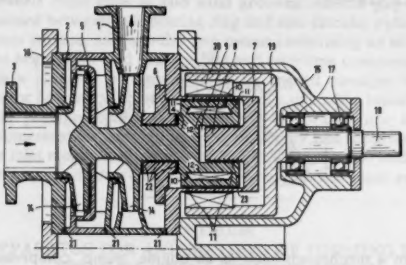
said displacer body includes a guide collar slidably received in said cylinder and an elongate, flexible tie portion extending from said guide collar to said coupling member whereby said flexible tie portion is free to deform when said coupling member tends to cock due to engagement of said abutment member against said stop means, thereby to relieve said guide collar of such cocking within said cylinder.

4,120,618

PERMANENT MAGNETIC CENTRIFUGAL PUMP

Franz Klaus, Uhland Strasse 54, 463 Bochum, Fed. Rep. of Germany

Filed Aug. 2, 1976, Ser. No. 710,929
Claims priority, application Fed. Rep. of Germany, Aug. 4, 1975, 2534740
Int. Cl.[2] F04B *17/00*
U.S. Cl. 417—420 8 Claims



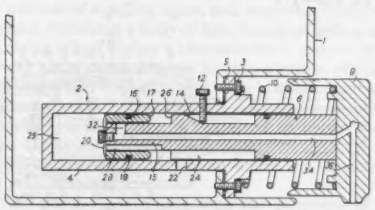
1. A high power, high pressure permanent magnet centrifugal pump having an impeller driving inner rotor with a plurality of individual permanent bar magnets associated therewith in which all components which are in direct contact with the pumped fluid, particularly the pump casing, the impeller assembly including its shaft, and the inner rotor, and the gap tube, are made entirely of a synthetic plastics material, in which the permanent magnets of the inner rotor are bar magnets of trapezoidal cross-section which are completely embedded in the inner rotor in dispostions parallel to the rotor axis, and their side faces and end faces are tapered and inclined towards each other in the radially outward direction, and in which bearing material which imparts the hardness and frictional properties of ordinary bearings to the bearing surfaces is incorporated in the synthetic plastics material forming the bearing surfaces of the bearings of the impeller assembly and inner driven rotor.

4,120,619

RECIPROCATING PUMPS FOR DISPENSING PASTES, LIQUIDS AND OTHER SUBSTANCES

Trevor William Blackbend, Sheffield, England, assignor to Sterling-Winthrop Group Limited, London, England

Continuation of Ser. No. 606,608, Aug. 21, 1975, abandoned. This application Aug. 29, 1977, Ser. No. 828,843
Int. Cl.[2] F04B *7/00;* G01F *11/06, 11/38*
U.S. Cl. 417—511 12 Claims



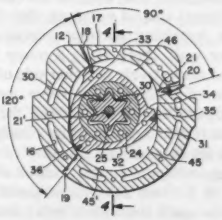
1. A reciprocating dispensing pump comprising:
a cylinder adapted to be attached to a product container, said cylinder having an open outer end and an inner end;
a piston slidably extending into said cylinder through said outer end thereof, said piston having an inner end defining with said inner end of said cylinder a space, said piston having adjacent said inner end thereof a reduced diameter length portion, said piston being movable inwardly of said cylinder from an outer first position to an inner second position;
spring means positioned to urge said piston to said outer second position;
said piston having therein a longitudinally extending outlet passage;
said piston having therein a product outlet port connecting said space and said outlet passage;
said piston having therein a product inlet port opening into said space independently of said outlet passage;
said outlet port having an extreme inner edge, said inlet port having an extreme outer edge, said extreme inner and outer edges being spaced by a first axial length;
a tubular sleeve slidably mounted on said reduced diameter length portion, said sleeve being axially displaceable relative to said piston between a first sleeve position and a second sleeve position in response to movement of said piston between said outer first and inner second positions of said piston;
said sleeve having an axially extending portion of a second axial length at least equal to said first axial length, said axially extending portion being completely solid and unperforated;
said axially extending portion of said sleeve, when said sleeve is in said first sleeve position, closing said outlet port, thereby blocking communication between said space and said outlet passage and being axially spaced from and thereby uncovering said inlet port;
said axially extending portion of said sleeve, when said sleeve is in said second sleeve position, closing said inlet port and being axially spaced from and thereby uncovering said outlet port, thereby allowing communication between said space and said outlet passage;
said axially extending portion of said sleeve never simultaneously uncovering both said inlet and outlet ports; and
said axially extending portion of said sleeve, during initial relative movement of said sleeve from said second sleeve position to said first sleeve position in response to initial movement of said piston from said inner second position to said outer first position, maintaining said inlet port blocked and said outlet port unblocked, such that a reduced pressure is created in said space and in said outlet passage, thereby withdrawing any product in said outlet passage inwardly therefrom into said space.

4,120,620

ROTARY INTERNAL COMBUSTION ENGINE

Adolph A. Campos, Newark, and Joseph V. Michele, Nutley, both of N.J., assignors to Campos Associates, Summit, N.J.

Filed Dec. 10, 1976, Ser. No. 749,642
Int. Cl.[2] F01C *1/02, 17/02;* F02B *55/14*
U.S. Cl. 418—61 A 8 Claims



1. In a rotary combustion engine comprising a main housing formed with a generally oval vertically elongated rotor cavity comprising a substantially semi-cylindrical lower portion, an arcuate top portion at a radial distance from the center of said lower portion greater than the radius of said lower portion, and arcuate upwardly convergent side portions smoothly connect-

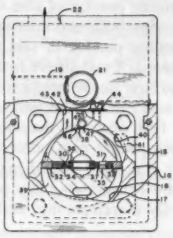
ing said arcuate top (tip) portion and substantially semi-cylindrical lower portion, said cavity having a fuel intake port communicating with the cavity at one side of said top portion, fuel ignition means in the cavity adjacent the opposite side of said top portion, said cavity being provided with a peripheral exhaust port in said lower portion at the same side of the cavity as said intake port, a shaft journaled in the housing with its axis displaced from said center toward said arcuate top portion, a rotor having a periphery comprising three successive sides of similar shape, means for supporting said rotor on said shaft and respective sealing members on the periphery of said rotor between its successive sides sealing engaging the peripheral surface of said rotor cavity and cooperating with said convergent side portions to cause the rotor to at times assume a depressed position providing a differential of radial distance between the center of the shaft and the portion of said peripheral surface at opposite sides of the ignition means engaged by two successive sealing members whereby to define differential in distance providing a differential surface on which combustion pressure in the space immediate adjacent one of said sealing members to provide a thrust (surface) on the rotor, the improvement which comprises utilizing as said rotor a rotor having a star-shaped aperture, said aperture loosely receving an intermediate portion of said shaft.

4,120,621

OIL SEALED SINGLE STAGE VACUUM PUMP

Richard E. Pikul, DeSoto, Mo., assignor to Puritan Bennett Corporation, Kansas City, Mo.

Filed Jul. 19, 1976, Ser. No. 706,937
Int. Cl.[2] F04C 27/02
U.S. Cl. 418—99 **2 Claims**



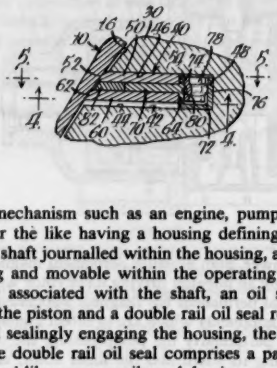
1. A rotary oil sealed single stage vacuum pump for producing an approximate absolute vacuum, comprising a cylindrical stator, a rotor eccentrically positioned for rotation within said stator, said stator having an interior wall, at least a pair of vanes radially disposed within and biased outwardly of said rotor, the outer ends of said vanes being in sliding contact with the inner cylindrical wall of the said stator, said rotor at one location being in contiguity with a segment of the interior wall of said stator, a crescent shaped pumping chamber being provided between the remaining portions intermediate the said rotor and the stator wall, there being a pump intake and an outlet port provided respectively to either side of the said rotor and stator location of contiguity, a valve means normally closing said outlet port, an oil slot formed through the said stator wall, proximate the location of its contiguity with the rotor and disposed for furnishing a quantity of oil to the said location for forming an oil seal thereat, said oil slot being offset between about 1° to 5° from the precise point of contiguity between the said rotor and stator, and being located closer to the pump intake, said oil slot being continuous along its length and being wider than the said valve means to provide for a constant flow of oil to said oil port and for formation of the oil seal at this location of rotor and stator contiguity, the length of said oil slot being less than the width of the pump rotor, said pump having a reservoir, said reservoir communicating with the outlet port and the oil slot and designed for supplying a quantity of oil to the location of the valve means and the location of contiguity between the said rotor and stator for forming the said seal thereat.

4,120,622

STATIC OIL SEAL ASSEMBLY

Alexander Goloff, East Peoria, and Charles E. Ballard, Dunlap, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 16, 1977, Ser. No. 797,222
Int. Cl.[2] F04C 27/00
U.S. Cl. 418—142 **7 Claims**



1. In a mechanism such as an engine, pump, compressor, expander or the like having a housing defining an operating chamber, a shaft journalled within the housing, a piston within the housing and movable within the operating chamber and operatively associated with the shaft, an oil seal receiving groove on the piston and a double rail oil seal received in the groove and sealingly engaging the housing, the improvement wherein the double rail oil seal comprises a pair of separate metallic, band-like scraper rails each having one side engaging said housing and an opposite side within said groove and a spacer of impervious, flexible material within said groove sealingly engaging said opposite sides of said scraper rails, said spacer including built-in spring means biasing said spacer into said sealing engagement and said scraper rails out of said groove; said spring means comprising an undulating leaf spring appearing corrugated in cross section with a surface facing said scraper rail opposite sides, a depression between opposite sides of said spring, the portion of said spring including said surface adjacent said depression serving to individually bias an associated one of said scraper rails.

4,120,623

PNEUMATIC VANE-TYPE MOTOR WITH BEARING RING FOR VANE TIPS

Gerd Löhn, Biberach, Germany, assignor to Kaltenbach & Voigt GmbH & Co., Biberach an der Riss, Germany

Filed May 5, 1977, Ser. No. 794,228
Claims priority, application Fed. Rep. of Germany, May 14, 1976, 2621486
Int. Cl.[2] F01C 1/00, 13/02, 21/02; F16C 35/00
U.S. Cl. 418—173 **1 Claim**

1. A pneumatic vane-type motor for a dental handpiece to drive a dental tool, comprising: a sleeve-shaped motor housing located in the outer surface of said handpiece and forming a stator; a circular-cylindrical inner surface of said housing; a rotor within said inner surface and having a rotary axis parallel to the axis of said cylindrical inner surface, said axes being spaced apart; a power take-off shaft connected to clutch means

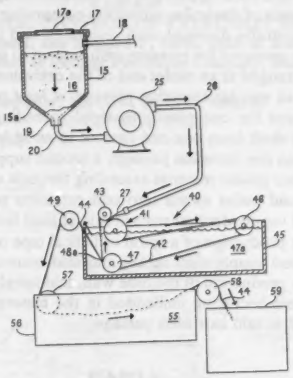
for driving said dental tool; axially extending grooves in said rotor; rotor vanes radially and movably mounted in said grooves and extending with their outer ends towards said circular cylindrical inner surface; air inlet means for compressed air and air outlet means discharging into a space between said rotor and said circular cylindrical inner surface; a bearing ring located between said circular cylindrical inner surface and said outer ends of said rotor vanes, said bearing ring being freely rotatable and coaxial with said inner surface; said bearing ring having an inner surface contacting said vanes at their outer ends in said axial grooves; annular gap means located between said bearing ring and said circular cylindrical inner surface, said annular gap means comprising an air cushion bearing for said bearing ring and receiving compressed air via a plurality of circumferentially spaced passages in said motor housing; a compressed-air supply line and a branch line; said passages being connected via said branch line to said compressed-air supply line, said air supply line supplying said air inlet means, said air inlet means discharging into said space between said rotor and said circular cylindrical inner surface.

4,120,624

APPARATUS FOR AND METHOD OF FORMING FOOD PRODUCT INTO A STRIP OR RIBBON

Clinton C. Witmer, and Frank M. Tate, both of Modesto, Calif., assignors to Tri/Valley Growers, San Francisco, Calif.

Filed Mar. 8, 1977, Ser. No. 775,557
Int. Cl.[2] B29D *7/00*; A23P *1/00*
U.S. Cl. 425—71 **2 Claims**



1. Apparatus for continuously producing a ribbon of gelled food material, such ribbon having a uniform thickness and width, said food material as introduced into the apparatus being liquid and being capable of gelling on contact with an aqueous solution of a gelling agent, said apparatus comprising:

(a) a vessel containing a body of liquid aqueous gelling agent

(b) a casting wheel having a circumferential groove having a width and a depth adapted to form a ribbon of the desired width and thickness, said wheel being mounted for rotation about a horizontal axis with its lower portion submerged in said body of liquid and its upper portion above the upper surface of said liquid

(c) an endless belt supported for movement in a closed path, said path including:

(1) first portion converging with the periphery of said wheel above the liquid level in said vessel,

(2) a second portion in peripheral contact with said wheel and overlying said peripheral groove to form a mold bounded by the wheel and the belt, said second portion extending from the point of convergence of the belt and wheel down into the body of liquid gelling agent,

(3) a third portion diverging from said casting wheel at a point below the upper surface of said liquid gelling agent and extending for a distance submerged in said liquid sufficiently to harden the surface of the ribbon, and

(4) a fourth, return portion to said point of convergence

(d) means continuously rotating said casting wheel and continuously moving said belt in its closed path and

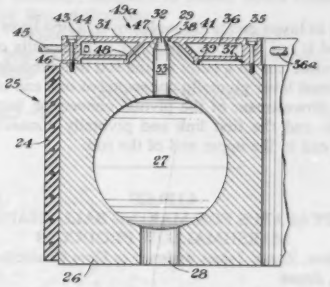
(e) means continuously supplying said liquid food material to said casting wheel in proximity to said point of convergence.

4,120,625

DIE FACE CUTTER

Earl T. Heckeroth, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 18, 1977, Ser. No. 788,384
Int. Cl.[2] B29F *3/08*
U.S. Cl. 425—71 **6 Claims**



1. An apparatus for the preparation of granules from a plurality of extruded heat-plastified synthetic resinous thermoplastic strands, the apparatus comprising in cooperative combination a die, the die having a die body, the die body defining an annular plenum, the plenum having a means to communicate with a source of heat-plastified synthetic resinous material, the die having a die face of generally annular configuration, the die body adjacent the die face defining a plurality of extrusion openings communicating with the annular plenum, the extrusion openings being capable of extruding heat-plastified synthetic resinous strands, the extrusion openings terminating on the die face remote from the means to communicate with such a source of heat-plastified thermoplastic resinous material, a cooling plate placed along the die face and being spaced in some areas from the die face, the cooling plate exposing the extrusion openings and permitting passage of the resinous strands, a rotatable cutter operatively associated with said plate to work against the cooling plate and to engage extruded thermoplastic strands emerging from the extrusion openings, to thereby sever the strands into pellets or granules, said die face where the extrusion openings terminate and a downstream surface of the cooling plate being coplanar

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4,120,626

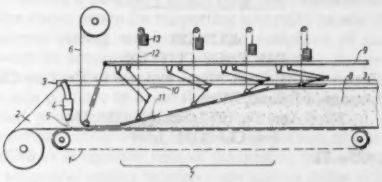
DEVICE FOR THE CONTINUOUS PRODUCTION OF FOAM BLOCKS OF RECTANGULAR CROSS-SECTION

Heinrich Keller, Troisdorf, Germany, assignor to Maschinenfabrik Hennecke GmbH, Leverkusen, Germany

Filed Jul. 1, 1977, Ser. No. 812,040
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1976, 2632302
Int. Cl.[2] B29D *27/04*
U.S. Cl. 425—89 **5 Claims**

1. In a device for the continuous production of foam blocks of rectangular cross-section, comprising an endless conveyor belt with side walls, means operatively associated with said conveyor for supplying a covering sheet to the upper surface of the upper rim of the conveyor belt and the side walls, a

charging device for supplying a foamable reaction mixture to the upstream end of the said upper rim of the conveyor belt, and a plurality of mold covers which are placed along the foaming area and each of which is suspended from a guiding device, the improvement wherein each guiding device comprises mounting means, first and second links secured to said mounting means, a diagonally extending rod pivotally con-



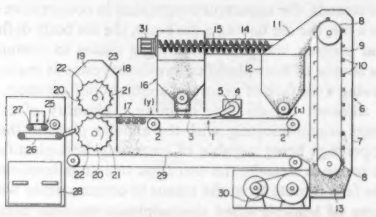
nected at its lower end to the mold cover, a first lever pivotally connected at one end to the first link and pivotally connected at its opposite end to a point on the rod intermediate its ends, and a second lever pivotally connected at one end to the second link downstream of the pivotal connection between the first lever and the first link and pivotally connected at its opposite end to the upper end of the rod.

4,120,627

APPARATUS FOR MAKING BALL-SHAPED MARSHMALLOW PRODUCTS

Minoru Abe, Zama, Japan, assignor to Eiwa Confectionary Co., Fuchu, Japan

Filed Mar. 16, 1977, Ser. No. 778,289
Int. Cl.[2] A23G *3/00*
U.S. Cl. 425—92 **9 Claims**



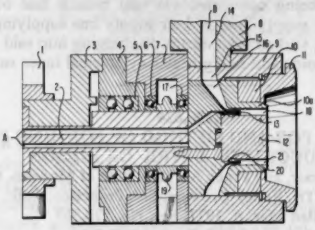
1. An apparatus for making a ball-shaped marshmallow product, comprising:
(a) a tubular extruder for forming a string of marshmallow,
(b) a conveyor belt disposed below a nozzle of the extruder for transporting said string of marshmallow,
(c) first and second powder supply means arranged adjacent each other proximate an inlet end of said conveyor belt,
(d) first and second feed hoppers respectively connected to said powder supply means, the former being disposed above the conveyor belt and upstream from the extrusion nozzle and the latter being disposed above the conveyor belt and downstream from said nozzle,
(e) a roll cutter disposed proximate the discharge end of said conveyor for cutting the powdered string of marshmallow at spaced intervals and forming each cut portion into a ball-shaped product,
(f) a drive source coupled to said conveyor, said powder supply means, and said roll cutter, and
(g) pressing and transferring means transferring each cut portion from the roll cutter to a container while simultaneously flat pressing each cut portion,
(h) said second powder supply means including an endless belt vertically disposed on a pair of rollers journalled above the other in a housing, and a plurality of bucket scoops mounted on the outer periphery of said belt, said second supply means being connected to said second hopper by a powder feed cylinder.

4,120,628

APPARATUS FOR MANUFACTURING PLASTIC TUBES FROM PLASTICS OF DISSIMILAR PROPERTIES

Rigas Christos Simos, Athens, Greece, assignor to General Enterprises Corp., Ltd., Greece

Continuation of Ser. No. 493,629, Jul. 31, 1974, abandoned, which is a continuation of Ser. No. 197,227, Nov. 10, 1971, abandoned. This application Nov. 24, 1976, Ser. No. 744,879
Claims priority, application Greece, May 5, 1971, 45310
Int. Cl.[2] B29D *23/04*
U.S. Cl. 425—131.1 **8 Claims**



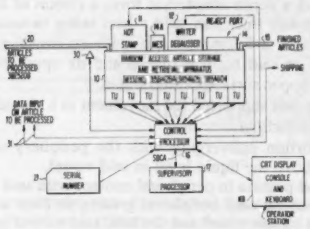
1. An extrusion apparatus for manufacturing plastic tubes from plastics of dissimilar properties comprising an outer shell, a shaft centrally disposed with respect to said outer shell and rotatably mounted for rotation with respect to said outer shell, means arranged at an outlet end of the extrusion apparatus for forming an annular extrusion passage, at least one first supply duct means for one plastic material extending through the rotatable shaft from one end thereof to an at least first outlet means into the extrusion passage, a second supply duct means for another plastic material extending through said outer shell to a second outlet means into said extrusion passage, said at least first supply duct means and said at least first outlet means being for production of a spiral or helical tape or filament, and said second supply duct means and said second outlet means being for production of the tube wall, said spiral or helical tape or filament becoming embedded in the material forming the tube wall in said extrusion passage.

4,120,629

PRODUCTION CONTROL APPARATUS

John Hunt Christian, Tucson, Ariz., and James Leroy Overacker, Morgan Hill, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 6, 1976, Ser. No. 702,638
Int. Cl.[2] B29C *3/00*; B65G *47/48*
U.S. Cl. 425—135 **3 Claims**



1. Article processing apparatus, including in combination: a random access article storage and retrieval apparatus having a multiplicity of addressable article storage locations;

a first article processing unit having an input and output port connected to said article storage apparatus;

a second article processing unit having an input and output port connection to said article storage and retrieval apparatus;

a plurality of article test units each individually having input and output ports to said article storage and retrieval apparatus;

means including an input port to said article storage and retrieval apparatus for receiving articles to be processed;

input service means for assigning said received article to one of said storage locations throughout the article processing procedures;

first unit service means for transferring articles from their respective storage locations to and from said first article processing unit;

second unit service means for selectively transferring articles from their respective storage locations to and from said second unit;

third unit service means for transferring articles from said respective storage locations to and from one of said plurality of article testing units;

queue means for assigning articles in a queue for said units while residing in such article storage locations;

a control processor responsive to said queue means for operating said random access article storage and retrieval apparatus to sequence an article first through said first unit then said second unit and then one of said test units.

4,120,630

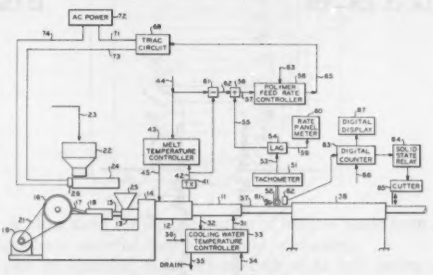
AUTOMATIC CONTROL OF EXTRUSION RATE

Ronald J. LaSpisa, and Richard F. Giles, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 12, 1976, Ser. No. 666,283

Int. Cl.[2] B29F *3/08*

U.S. Cl. 425—142 **8 Claims**



1. Automatically controlled extruder apparatus comprising:

an extruder having a plasticization section and a long land die section for producing an extrudate of a predetermined cross section, means operatively associated with said plasticization section and said long land die section for moving material through said plasticization section and then through said long land die section, heating means operatively associated with said plasticization section for supplying heat to said material in said plasticization section so that said material is molten at the inlet of said long land die section, cooling means operatively associated with said long land die section for removing heat from said material in said long land die section so that at least the outer portions of the extrudate solidify before leaving said long land die section;

feed means operatively associated with said extruder for feeding particles of said material into said plasticization section at a manipulatable rate; and

automatic control means operatively associated with said extruder and said feed means comprising means for measuring the actual rate of extrusion of said extrudate and establishing a first signal representative thereof, means for establishing a second signal representative of the desired rate of extrusion of said extrudate, means responsive to said first and second signals for establishing a third signal which bears a predetermined relationship to the magnitude and sign of the difference between said actual rate of extrusion and said desired rate of extrusion, and means responsive to said third signal for adjusting said feed means to manipulate the rate of feeding of particles into said plasticization section to maintain said actual rate of extrusion at least substantially equal to said desired rate of extrusion.

4,120,631

INJECTION-MOLDING MACHINE FOR SYNTHETIC PLASTIC MATERIAL

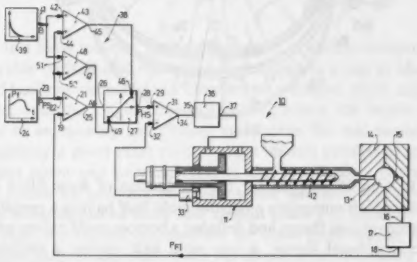
Volkmar Leutner, and Roman Romes, both of Friolzheim, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 8, 1976, Ser. No. 664,806

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1975, 2514009

Int. Cl.[2] B29F *1/06*

U.S. Cl. 425—145 **18 Claims**



1. An injection-molding machine of the type which is operative when activated for performing a complete injection-molding cycle, the machine comprising, in combination, means defining a mold cavity; injecting means so positioned relative to the mold cavity as to be operative for injecting synthetic plastic material into the mold cavity; hydraulic drive means coupled to the injecting means and operative for driving the injecting means, and including an hydraulic cylinder; and regulating means coupled to the hydraulic drive means and, by controlling the operation of the hydraulic drive means, operative for effecting negative-feedback control of the pressure in the mold cavity and negative-feedback control of the pressure in the hydraulic cylinder, and including means operative during the course of the injection-molding cycle for effecting an automatic transition from negative-feedback control of the mold cavity pressure to negative-feedback control of the hydraulic cylinder pressure, the regulating means comprising a first feedback transducer located to sense the pressure inside the mold cavity and operative for generating a first feedback signal whose value is indicative of the mold cavity pressure, a second feedback transducer located to sense the pressure inside the hydraulic cylinder and operative for generating a second feedback signal whose value is indicative of the hydraulic cylinder pressure, actuating means hydraulically coupled to the hydraulic cylinder and operative for controlling the pressure in the hydraulic cylinder in dependence upon the value of a received actuating signal, the means for effecting the automatic transition comprising means connected to the actuating means and to the first and second feedback transducers and operative for applying to the actuating means in actuating signal whose value varies as a function of variations in the value of the first feedback signal during the negative-feedback control of the mold cavity pressure and whose value varies as

a function of variations in the value of the second feedback signal during the negative-feedback control of the hydraulic cylinder pressure.

4,120,632

MOLDS FOR PRODUCTION OF PLASTICS MATERIAL BOATS

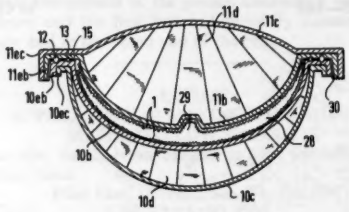
Helmut Stoeberl, Gstadt, Germany, assignor to Klepper-Werke Kommanditgesellschaft, Germany

Continuation-in-part of Ser. No. 450,785, Mar. 13, 1974, abandoned, which is a division of Ser. No. 323,319, Jan. 12, 1973, Pat. No. 3,840,926. This application Jun. 21, 1976, Ser. No. 698,151

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1972, 2201310

Int. Cl.[2] B29C *1/00*

U.S. Cl. 425—405 R **15 Claims**



1. A mold adapted for the production of foam-filled boat hulls which comprises a bottom mold half having a peripheral outturned side flange and defining a bottom mold cavity within the peripheral flange, a top mold half having a peripheral outturned side flange overlying the peripheral flange of the bottom mold half and defining within the peripheral flange a top wall for the mold cavity, said peripheral flanges of said bottom and top mold halves defining the parting line for the mold and having mating portions defining grooves, means for venting said grooves to suction to draw the peripheral flanges together to seal the parting line and for venting said grooves to pressure to open the parting line and separate the mold halves, and additional means in one peripheral flange for venting air from the closed mold cavity.

4,120,633

EXTRUSION PRESS HEAD FOR THE EXTRUSION OF TUBULAR STRANDS OF PLASTIC MATERIAL

Harald Feuerherm, Alfred-Delp-Str. 1, 5210 Troisdorf, Fed. Rep. of Germany

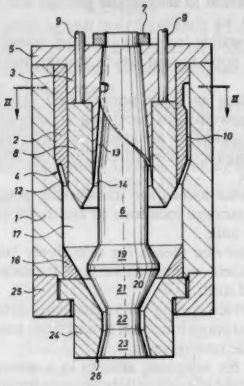
Filed Jun. 7, 1977, Ser. No. 804,378

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1976, 2625786; Sep. 3, 1976, 2639665

Int. Cl.[2] B29D *23/04*

U.S. Cl. 425—462 **19 Claims**

1. In an extrusion press head for the extrusion of tubular strands of plastic material, a combination comprising an outer housing; a mandrel extending coaxially through said outer housing and defining therewith an annular space; an annular piston axially movable in said annular space; and at least one feed channel for a plasticized material, said at least one feed channel having an annular outlet end communicating with said annular space below the piston, said annular outlet end having an inner diameter which is greater than the inner diameter of



the annular piston so that at least part of said annular piston is located between said outlet end and said mandrel.

4,120,634

APPARATUS FOR THE CONTINUOUS PRODUCTION OF ORIENTED HOLLOW BODIES FROM A THERMOPLASTIC

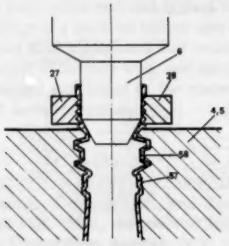
Edmond Michel, Brussels; Marcel Duikers, La Hulpe, and André Poty, Lillois-Witterzee, all of Belgium, assignors to Solvay & Cie., Brussels, Belgium

Filed Mar. 4, 1977, Ser. No. 774,657

Claims priority, application France, Mar. 22, 1976, 76 08421

Int. Cl. B29D *23/03*

U.S. Cl. 425—525 **12 Claims**



1. Apparatus for the continuous production of oriented hollow bodies from a thermoplastic by blow-extrusion, which comprises a means for the extrusion of at least one continuous tubular parison from the thermoplastic and also comprises (1) at least one first station provided with means for blow-moulding lengths of the tubular parison into preforms, and which receives at least one preform mould which seizes a length of extruded parison whilst leaving open one end of this length which protrudes beyond the mould, and at least one blow nozzle means which can be introduced into the open and protruding end of the length of parison so as to provide the preforms with a definitive moulded neck and a part located thereabove with the part of the preform below the neck being the part molded in the final blow molding means, (2) at least one fixed second station provided with means for the heat conditioning of the preforms to their orientation temperature and (3) at least one fixed third station provided with means for the final blow-moulding of the conditioned preforms into the finished bodies, equipped with at least one blow nozzle and at least one

final blow mould of which the cavity reproduces the shape of the desired oriented hollow bodies, characterized in that the transfer of the preforms from one of these stations to the other is ensured by movable equipment and gripping organs mounted on the movable equipment, the gripping organs having means gripping the part of the preforms located above their neck and being moved by the movable equipment so as to disengage the preforms from the successive stations, transfer them to the next station and engage them in this station.

4,120,635

BLOW MOLD FOR THE PRODUCTION OF BELLOWS MADE OF A HIGHLY ELASTIC PLASTIC

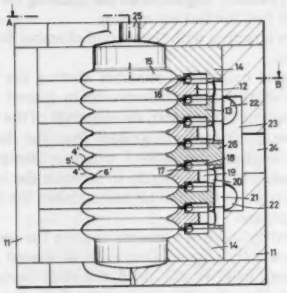
Erhard Langecker, Hohbuschener Weg 5, Meinerzhagen, Fed. Rep. of Germany

Filed Feb. 7, 1977, Ser. No. 765,984

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1976, 2605546

Int. Cl.[2] B29D *23/03*

U.S. Cl. 425—535 **5 Claims**



1. A blow mold for the production of bellows made from a highly elastic material, said blow mold comprising:

a pair of separable mold halves, each mold half having a plurality of adjacent semi-circular shaped disk elements having abutting facing areas defining facing planes and are positioned parallel with reference to each other, said disk elements of each mold half being stacked to form a column, said column defining a bellows-shaped mold cavity, the cavity having outer apexes and inner apexes, the outer apexes of the mold cavity being located at the facing planes of adjacent disk elements, the inner apexes being defined by the innermost extension of each disk element, the areas of the cavity between said inner and outer apexes defining the side flanks of the bellows-shaped mold cavity, said side flanks being curved from the inner to the outer apexes, said facing planes of said adjacent disk elements each defining at each of said outer apexes an arcuate slit which extends substantially the full arcuate length of the adjacent disk elements, said slits communicating with said mold cavity at said outer apexes; and

passage means in said mold for selectively communicating compressed air to said cavity or a vacuum to said slits for respectively communicating compressed air to said cavity and venting air from said cavity.

4,120,636

APPARATUS FOR BLOW-MOLDING HOLLOW ARTICLES, IN PARTICULAR BOTTLES

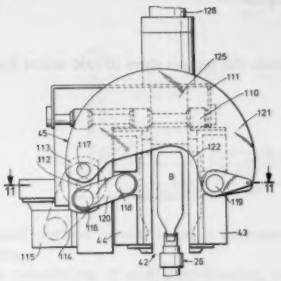
Adolf Appel, and Wolfgang Reymann, both of Hamburg, Germany, assignors to Gildemeister Corpoplast GmbH, Hamburg, Germany

Filed Oct. 1, 1976, Ser. No. 728,827

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1975, 2545130

Int. Cl.[2] B29D *23/03*

U.S. Cl. 425—541 **6 Claims**



1. In a blow molding apparatus wherein an axially elongated blowable parison is blown into a final article in a pair of blow mold sections openable and closable on a median plane coinciding with the longitudinal axis of the parison, the improvement of an opening and closing mechanism for said sections comprising a pivot plate pivotal about an axis parallel to said median plane and perpendicular to the longitudinal parison axis, means for pivoting said plate about said axis, said pivot plate being displaced from said median plane and adjacent to one mold section and remote from the other mold section and being in general alignment with the direction of movement of the adjacent mold section, a relatively short pivot link interconnecting the adjacent mold section and the pivot plate, a relatively long pivot link interconnecting the remote mold section and said pivot plate and projecting from the pivot plate across the median plane to the remote mold section, said links being connected to said pivot plate on opposite sides of said pivot plate axis, the link connections to the pivot plate being aligned in a plane substantially parallel to the median plane of the mold sections when the mold sections are open and being aligned in a plane substantially normal to the median plane when the mold sections are closed.

4,120,637

HOT WATER SPRAY INJECTION FOR SMOKE SUPPRESSION IN FLARES

Robert D. Reed, Tulsa, Okla., assignor to John Zink Company, Tulsa, Okla.

Filed Oct. 26, 1976, Ser. No. 735,625

Int. Cl.[2] F23G *7/06*

U.S. Cl. 431—5 **10 Claims**

1. Apparatus for utilizing hot water for smoke suppression in flares for vented hydrocarbons, comprising;

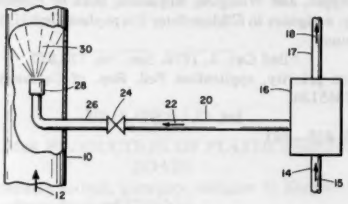
(a) conduit means for the flow of waste gases to a flare for burning in the atmosphere;

(b) means to supply hot water under pressure to a plurality of nozzles within said conduit means;

whereby said hot water will be sprayed in cones of fine water droplets, at high velocity, into said flow of waste gases to thoroughly turbulently mix therewith;

whereby said mixture of water droplets, and gas will reach a selected resultant temperature, in which said gas will be saturated at said temperature; and

(c) control means to control the rate of flow of hot water responsive at least to the rate of mass flow of waste gases;



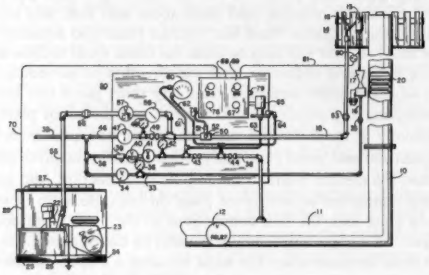
and wherein the temperature of said water is at least 150° F.

4,120,638

IGNITION SYSTEM FOR FLARES

John F. Straitz, III, Meadowbrook, Pa., assignor to Combustion Unlimited Incorporated, Elkins Park, Pa.

Filed Jul. 15, 1977, Ser. No. 815,991
Int. Cl.[2] F23D *13/20*
U.S. Cl. 431—15 **12 Claims**



1. An ignition system for flares comprising

a flare stack, a pilot for igniting gas discharged from said flare stack,

an igniter pipe extending to said pilot for directly initiating the operation of said pilot by flame propagation thereto,

a portable source of electric energy,

a source of fuel gas for ignition and for pilot gas supply,

portable means for supplying air under pressure for admixture with fuel gas from said source and for delivery to said igniter pipe,

an ignition coupling to which said source of gas and said means for supplying air are connected through manually controlled valves for said air and said gas and which is connected to said igniter pipe,

said ignition coupling having a spark plug connected thereto energized by a spark coil,

a manually operable switch connected to said source of electric energy and to said spark coil for energizing said spark plug for delivering a flame for propagation in said igniter pipe, and

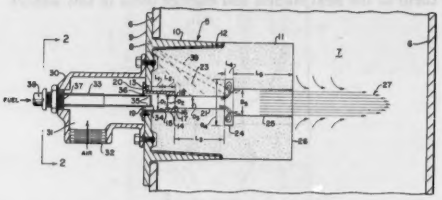
a fluid connection to said pilot from said source of fuel gas and having an air induction device therein.

4,120,639

HIGH MOMENTUM BURNERS

Arvind C. Thekdi, Sylvania; Dennis A. Chojnacki, Toledo, and Klaus H. Hemsath, Sylvania, all of Ohio, assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Jun. 30, 1977, Ser. No. 811,601
Int. Cl.[2] F23R *1/02*
U.S. Cl. 431—158 **12 Claims**



1. A high momentum burner, comprising:

(a) means for discharging an annular stream of air, under pressure, through an annular orifice at a predetermined velocity; (b) means for radially directing into the stream of air, a combustible fuel for admixture with the air;

(c) a burner insert coacting with the orifice and having an opening coaxially aligned with the orifice, the insert designed to increase the velocity of the stream of air and fuel through the opening, whereby a more intimate contact of the fuel and air is achieved;

(d) a first cylindrical chamber abuting the opening of the insert in spaced relation from the orifice, the first chamber being coaxially aligned with the opening for receiving the air and fuel for further mixing;

(e) means coacting with the second chamber for igniting fuel therein;

(f) a second cylindrical chamber abuting the first chamber and coaxially aligned therewith in spaced relation from the opening of the insert, the diameter of the second chamber being substantially greater than the diameter of the first chamber, the second chamber designed to cause recirculation of gas therein to increase the temperature of the mixture of fuel and air and stabilize the combustion of the fuel; and

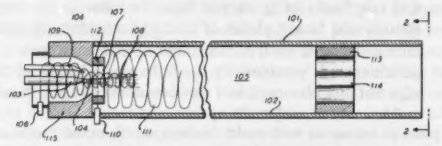
(g) a third cylindrical chamber abuting the second chamber and coaxially aligned therewith in spaced relation from the first chamber, the third chamber having a diameter greater than the diameter of the first chamber and less than the diameter of the second chamber, the chambers being sized relative to each other to maintain therein, a fluid pressure which is less than the ambient atmosphere into which the flame and any entrained fluid and products of combustion are discharged.

4,120,640

BURNER FOR LIQUID FUEL

Charles K. Martin, Boonton, N.J., assignor to Infern-O-Therm Corporation, Keyport, N.J.

Filed Feb. 18, 1977, Ser. No. 770,195
Int. Cl.[2] F23D *15/02*
U.S. Cl. 431—353 **8 Claims**



1. A burner for liquid fuel, comprising:

(a) a combustion tube, having an inner surface;

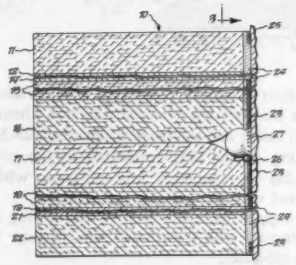
(b) an end bell, secured to the combustion tube;
(c) nozzle means, secured to the end bell, for atomizing the liquid fuel and introducing the liquid fuel as a fine spray, into a combustion chamber defined by the inner surface of the combustion tube;
(d) auxiliary air introduction means, secured to one end of the end bell, for producing an auxiliary vortex flow of air around and concentric with the nozzle means so as to entrain the fine spray of liquid fuel and form a fuel-air mixture, the fuel-air mixture being carried by the auxiliary vortex flow of air into the combustion chamber;
(e) means for igniting the fuel-air mixture;
(f) main air introduction means, secured to the other end of the end bell, for producing a main vortex flow of air around the fuel-air mixture, the main vortex flow of air serving to separate the fuel-air mixture from the inner surface of the combustion tube and to provide additional air for combustion of the fuel-air mixture; and,
(g) collar means, secured to the end bell and surrounding the nozzle means, the collar means for controlling combustion of the fuel-air mixture by controlling the manner in which the fuel-air mixture is transported into the combustion chamber and the rate at which the fuel-air mixture mixes with the main vortex flow of air, the collar means is a right circular cylindrical shell surrounding the nozzle means.

4,120,641

CERAMIC FIBER MODULE ATTACHMENT SYSTEM

Thomas Aquinas Myles, Tonawanda, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y.

Filed Mar. 2, 1977, Ser. No. 773,586
Int. Cl.² F27D *1/16*
U.S. Cl. 432—3 **19 Claims**



1. A ceramic fiber module, comprising:
(a) a weldable backing;
(b) a plurality of ceramic fiber mats, each mat being substantially perpendicular to the backing, and all of the mats of a module being substantially parallel to each other;
(c) adhesive, bonding at least a portion of one end of each ceramic fiber mat to the weldable backing, leaving a portion of the backing accessible; and
(d) metallic spherical means for welding the backing to a metallic at the accessible position of the backing substrate.

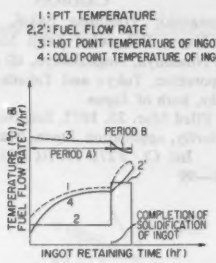
4,120,642

METHOD FOR HEATING INGOT IN SOAKING PIT

Kohichiroh Miyauchi; Atsushi Ohsumi; Yukio Haga; Tsutomu Izumi; Masahiro Tsuru, all of Fukuyama; Kazuo Kunioka, and Shunichi Sugiyama, both of Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed May 2, 1977, Ser. No. 792,800
Claims priority, application Japan, May 25, 1976, 51-59697
Int. Cl.² C21D *1/52;* F27B *3/02*
U.S. Cl. 432—12 **3 Claims**

1. A method for heating a steel ingot in a soaking pit, which comprises:
charging a steel ingot having a still-liquid portion therein into a soaking pit; then,
heating said ingot by injecting a fuel from a combustion unit of said soaking pit into said soaking pit with a constant and minimum fuel flow rate capable of holding a pit temperature higher by from 10° to 100° C than the cold point temperature of said ingot at the completion of solidification of said still-liquid portion in said ingot, until said


1 : PIT TEMPERATURE
2,2' : FUEL FLOW RATE
3 : HOT POINT TEMPERATURE OF INGOT
4 : COLD POINT TEMPERATURE OF INGOT
TEMPERATURE (°C) & FUEL FLOW RATE (kg/hr)
PERIOD B
PERIOD A
COMPLETION OF SOLIDIFICATION OF INGOT
INGOT RETAINING TIME (hr)

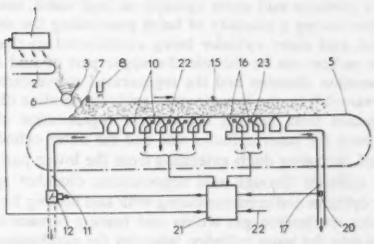
still-liquid portion in said ingot is completely solidified; and then,
upon the completion of said solidification, further heating the surface portions of said ingot up to above a prescribed temperature permitting rolling thereof by injecting a fuel from said combustion unit into said soaking pit with a constant fuel flow rate of at least 60% of the maximum fuel flow rate of said combustion unit, thereby reducing the fuel consumption in said soaking pit.

4,120,643

METHOD OF REGULATING THE PROCESS OF AGGLOMERATION OF A MINERAL ON AN ENDLESS CHAIN

Michel Benoit, Puteaux, France, assignor to Delattre-Levivier, Courbevoie, France

Filed Dec. 24, 1975, Ser. No. 644,173
Claims priority, application France, Jan. 15, 1975, 75 01061
Int. Cl.² F27B *9/12;* C22C *1/20*
U.S. Cl. 432—36 **5 Claims**



1. A method of regulating the process of agglomeration of products, the products including minerals, on an endless conveyor traveling at constant speed, comprising the steps of:
passing the products on the conveyor through a firing zone, the firing zone having a first set of suction boxes disposed below the conveyor, the first set of suction boxes being connected to a common firing suction duct;
passing the fired products on the conveyor through a cooling zone, the cooling zone having a second set of suction boxes disposed below the conveyor, the second set of suction boxes being connected to a common cooling suction duct, gases passing through the suction ducts;
measuring the temperature of the gases in the common cooling suction duct;

comparing the measured temperature with a preset temperature, a signal resulting from the temperature comparison; and

regulating the flow of gases in the common firing suction duct from the comparison signal.

4,120,644

APPARATUS FOR REGENERATION OF SPENT ACTIVE CARBON

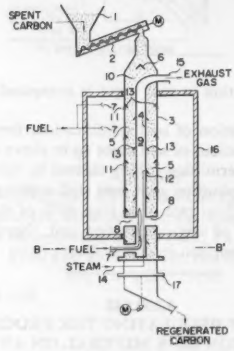
Kouichi Numasaki; Yoshihisa Sakai, both of Yokohama; Takehiko Nawa, Yokosuka; Zenji Matsumoto, Izumi, and Nobutaka Ninomiya, Nagaokakyo, all of Japan, assignors to JGC Corporation, Tokyo and Takeda Chemical Industries, Ltd., Osaka, both of Japan

Filed Mar. 23, 1977, Ser. No. 780,790

Claims priority, application Japan, Mar. 31, 1976, 51-35862

Int. Cl.[2] F27B *15/10*; B01J *8/12*

U.S. Cl. 432—99 **9 Claims**



1. A double-cylinder type apparatus for regeneration of spent active carbon, which comprises a heating furnace provided with at least one burner and at least one annular regeneration chamber composed of an inner cylinder and an outer cylinder installed concentrically inside said heating furnace and extending from the top of said furnace to the bottom of said furnace and arranged so that the heated gas from said burner contacts said outer cylinder to heat same, said outer cylinder having a plurality of holes penetrating the side wall thereof, said outer cylinder being constructed so that spent active carbon can be fed into the upper part of said annular regeneration chamber and the regenerated active carbon can be removed from the lower part of said regeneration chamber, and means from heating the annular regeneration chamber from both the inner cylinder side and the outer cylinder side thereof, including ducts extending from the lower part of said inner cylinder through said regeneration chamber and said outer cylinder and communicating with said heating furnace so that the combustion gas within said heating furnace is introduced into the inner cylinder, whereby the combustion gas is effective to heat said annular regeneration chamber from both the inner cylinder side and the outer cylinder side thereof.

4,120,645

SYSTEM FOR HANDLING HIGH SULFUR MATERIALS

Glenn A. Heian, Franklin, Wis., and Robert F. Kohl, Tucson, Ariz., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Division of Ser. No. 576,995, May 13, 1975, Pat. No. 4,065,320. This application Jan. 27, 1977, Ser. No. 762,980

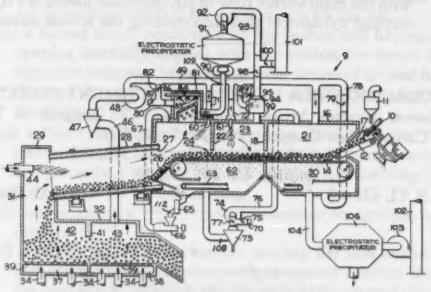
Int. Cl.[2] F27B *7/02*

U.S. Cl. 432—106 **16 Claims**

1. In a material heat-treating furnace apparatus (**9**) having structure defining a drying chamber (**21**) for receiving a cement material to be treated and for preconditioning the material, and at least one preheat chamber (**23-24**) for receiving material from the drying chamber (**21**), a travelling grate (**14**) mounted within the structure for conveying the material successively through the respective chambers, a first windbox (**30**) located beneath the travelling grate (**14**) in the drying chamber (**21**), a second windbox (**62**) located beneath the travelling grate in the preheat chamber (**23-24**), a kiln (**28**) mounted to receive material directly from the preheat chamber (**23-24**), and at least one cooling chamber (**43**) disposed to receive material from the kiln, the drying and preheat chambers, the kiln, and the cooling chamber being connected in a series flow arrangement to define a material flow path from the drying chamber to the cooling chamber, a fan system means (**74**) including a first dust collector means (**73**) for withdrawing gases from the second windbox (**62**) and passing them to the drying chamber (**21**), and gas-conveying means for directing usable gases developed within the apparatus into various zones of the apparatus, comprising:

means (**81-91-93-98-99**) for directing off-gases from the kiln (**28**) into the preheat chamber (**23-24**);

a supply source (**63**) of lime-bearing material which is chemically reactive with sulfur;



a first duct (**67**) means connected between said supply source of a lime-bearing material which is chemically reactive with sulfur and the preheat chamber (**23-24**);

a mixing device (**81**) connected to the preheat chamber (**23-24**) for receiving kiln off-gases which have been treated with the lime-bearing material;

an air supply (**82**) connected to said mixing device (**81**) for mixing air with the treated kiln off-gases to temper said kiln off-gases;

a second duct means (**109**) connected to said mixing device (**81**);

a second dust collector means (**90-91**) connected to said mixing device (**81**) and to the preheat chamber (**23-24**) for the removal of solid sulfur compound dust particles from the tempered mixed gases prior to said tempered mixed gases being supplied to the preheat chamber; and,

a third duct means (**93-99**) connected between said second dust collector means (**90-91**) and the preheat chamber for passing cleansed tempered mixed gases back through the material in the preheat chamber.

4,120,646

OVEN HEATING SYSTEM

Edwin I. Groff, and Edwin Terry Groff, both of 301 W. Chestnut St., West Reading, Pa. 19602

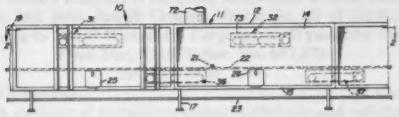
Filed Mar. 7, 1977, Ser. No. 774,900

Int. Cl.[2] F27B *9/00*

U.S. Cl. 432—121 **10 Claims**

1. Heating apparatus comprising an elongate chamber, conveyor means extending longitudinally through and in general parallelism with said chamber for moving product to be heated, and a plurality of heating elements in said chamber,

each of said heating elements comprising an elongate conductive tube extending transversely across the path of conveyor movement, a fuel burner at one end of said tube for introducing a combustible mixture into said one tube end to provide a flame extending internally along said tube, and outlet means in said tube adjacent to the other end thereof for discharging combustion products, said outlet means opening laterally from said tube generally longitudinally of said chamber in a plane generally parallel to said conveyor and chamber, for radiation by said tube and convection by said outlet means without direct



combustion product discharge against said conveyor or chamber.

4,120,647

PROCESS FOR THE DYEING OF WOOL-CONTAINING FIBRE MATERIALS

Alain Lauton, Saint-Louis, France, and Hans-Ulrich Berendt, Allschwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 23, 1977, Ser. No. 799,908
Claims priority, application Switzerland, Jun. 4, 1976, 7114/76; Sep. 21, 1976, 11934/76
Int. Cl.[2] D06P *5/00, 3/16, 1/645;* D06M *3/02*
U.S. Cl. 8—17 13 Claims

1. A process for the dyeing of wool-containing fibers, selected from the group consisting of wool and polyester/wool blend comprising the step of treating the fibers in the temperature range of 95° to 125° C. with a dye liquor comprising an anionic dye and a cyclic N-methylolurea compound which is etherified or unetherified.

4,120,648

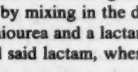
DYE PREPARATION

Suresh C. Agarwal, Bottmingen, and Zdenek Koci, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 16, 1976, Ser. No. 751,224
Claims priority, application Switzerland, Dec. 23, 1975, 16690/75
Int. Cl.[2] C09B *67/00;* D06P *1/642;* C07D *233/34*
U.S. Cl. 8—85 R 1 Claim

1. A solid dye preparation consisting essentially of a powder or granulates obtained by mixing in the dry state:

(1) a 1:1 adduct of thiourea and a lactam, or a 1:1 adduct of dicyandiamide and said lactam, wherein said lactam is of the formula



wherein

x is 3 to 6, or mixtures thereof;

(2) a water-soluble acid dye in an amount that said preparation contains 0.2 to 1 part by weight of said lactam per part of said dyestuff;

(3) alone or in the presence of dextrin, urea, sodium chloride, sodium sulphate, anionic dispersing or wetting agents, condensation products of cresol, naphtholsulfonic acid and formaldehyde, or antidusting agents.

4,120,649

TRANSPLANTS

Israel Schechter, Neve Matz 12, Rehovoth, Israel

Filed Mar. 29, 1976, Ser. No. 671,728
Claims priority, application Israel, Apr. 10, 1975, 47062
Int. Cl.[2] C14C *3/16;* A61F *1/24*
U.S. Cl. 8—94.11 25 Claims

1. A process for diminishing the antigenicity of tissues derived from one species when used as a transplant in a different species, for rendering such tissues substantially resistant to infection, and for rendering such tissues liable to be stored for a prolonged period of time, comprising:

treating the tissue in a solution of glutaraldehyde in an aqueous solvent of suitable pH; and

transplanting the treated tissue into an animal species different than that from which the original tissue was derived.

4,120,650

LAUNDERING PROCESS FOR DUAL BLEACHING STAINED FABRICS

Frank Robert Kappler, Wyandotte; Roma Jean Killian, Melvindale, and John Joseph Cramer, Grosse Ile, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 5, 1977, Ser. No. 857,675
Int. Cl.[2] D06L *3/06*
U.S. Cl. 8—109 14 Claims

1. A method of reclaiming stained cellulosic and cellulosic-polyester blend textile fabrics by a washing and bleaching process comprising: bleaching said textile fabrics in an aqueous solution of at least one anionic or non-ionic surface-active agent at a concentration of about 0.01 percent to about 0.25 percent by weight in admixture with (a) about 0.01 percent to about 1 percent by weight of a chlorine-releasing agent and (b) about 0.01 percent to about 2 percent by weight of an oxygen-releasing agent at a pH of about 9 to about 12, a temperature of about 160° F. to about 190° F. for a period of time of about 5 minutes to about 30 minutes.

4,120,651

DISULFONES AS PEROXYGEN ACTIVATORS

Clifford A. Erickson, Princeton; Joseph H. Finley, Metuchen; John H. Blumbergs, Highland Park, and Fred R. Scholer, Cranbury, all of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Oct. 3, 1977, Ser. No. 838,848
Int. Cl.[2] D06L *3/02*
U.S. Cl. 8—111 12 Claims

1. A process for the low temperature bleaching of stained and/or soiled fabrics which comprises treating them with an aqueous peroxygen bleaching solution having a pH of about 6 to about 12 and containing as a peroxygen activator therefor, an effective amount of a disulfone having the formula:

$$RSO_2SO_2R_1$$

wherein R and R_1, which may be alike or different, are each selected from the class consisting of an alkyl radical of 1 to 18 carbon atoms; a cycloalkyl radical of 3 to 7 carbon atoms said alkyl and cycloalkyl radicals bearing optional substituents selected from the group consisting of lower alkoxyl, fluoro and chloro; and an aromatic radical selected from the group consisting of phenyl, naphthyl and heterocyclic having 1 ring or 2 fused rings containing 5 to 6 members of which 1 to 2 are heteroatoms selected from the class consisting of nitrogen, oxygen and sulfur, said aromatic radicals optionally bearing 1 to 3 substituents selected from the class consisting of nitro, alkyl of 1 to 16 carbon atoms, alkoxy of 1 to 16 carbon atoms, aliphatic carboxamido of 1 to 16 carbon atoms, benzamido, chlorine and bromine.

4,120,652

AROMATIC SULFONYL AZIDES AS PEROXYGEN ACTIVATORS

Fred R. Scholer, Cranbury, and John H. Blumbergs, Highland Park, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Oct. 3, 1977, Ser. No. 838,905
Int. Cl.[2] D06L *3/02;* C11D *7/54*
U.S. Cl. 8—111 15 Claims

1. A process for the low temperature bleaching of stained or soiled fabrics which comprises treating them with an aqueous peroxygen bleaching solution having a pH of about 6 to about 12 and containing as a peroxygen activator therefor, an effective amount of an aromatic sulfonyl azide having the formula:

$$R-(SO_2N_3)_n$$

wherein R is an aromatic ring selected from the group consisting of phenyl, naphthyl and heterocyclic of 1 or 2 rings each containing 5 to 6 members of which 1 or 2 are nitrogen or

sulfur atoms said aromatic ring optionally bearing 1 to 3 substituents selected from the group consisting of nitro, alkyl of 1 to 6 carbon atoms, lower fluorinated alkyl alkoxy of 1 to 6 carbon atoms, aliphatic carboxamido of 1 to 6 carbon atoms, benzamido and halogen and *n* is an integer 1 or 2, it being provided that there are at least 5 carbon atoms per azide function.

8. A bleaching composition consisting essentially of a peroxygen bleaching compound and as a peroxygen activator, an aromatic sulfonyl azide of the formula:

$$R—(SO_2N_3)_n$$

wherein R is an aromatic ring selected from the group consisting of phenyl, naphthyl and heterocyclic of 1 or 2 rings each containing 5 to 6 members of which 1 or 2 are nitrogen or sulfur atoms said aromatic ring optionally bearing 1 to 3 substituents selected from the group consisting of nitro, alkyl of 1 to 6 carbon atoms, lower fluorinated alkyl alkoxy of 1 to 6 carbon atoms, aliphatic carboxamido of 1 to 6 carbon atoms, benzamido and halogen and *n* is an integer 1 or 2, it being provided that there are at least 5 carbon atoms per azide function.

4,120,653

METHOD OF MACHINE WASHING OF SOLID SOILED MATERIALS BY CONTACTING THE CIRCULATING WASH LIQUID WITH ORGANIC CATIONIC EXCHANGE RESINS

Heinz Smolka, Langenfeld, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Nov. 2, 1977, Ser. No. 847,792

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1976, 2651793

Int. Cl.[2] B08B *3/00*

U.S. Cl. 8—137 **9 Claims**

1. A method for machine washing and cleaning of solid materials utilizing washing and cleaning solutions in the presence of water-insoluble cation exchange agents which are capable of binding the hardness components of the water and the soil, comprising withdrawing and recycling the tap water having a hardness of more than 80 mg CaO/liter in contact with said solid soiled materials through a water-insoluble cation exchange copolymer in particulate state having a swelled average particle diameter in excess of 20μ and having a calcium binding power of at least 2 mVal/gm, said copolymer being a copolymer or graft polymer derived from monoolefinically-unsaturated carboxylic acids, said cation exchange copolymer being maintained out of contact with said solid soiled materials in a separate area from the washing area, for such time until the water has a hardness of not more than 70 mg CaO/liter, then adding other soluble washing and cleaning compounds including between 0.5 gm/liter and 2 gm/liter of a water-soluble calcium-binding sequestrant and customary surface-active compounds selected from the group consisting of an anionic surface-active compound, a nonionic surface-active compound and mixtures thereof to said softened tap water and washing said solid materials while continuing the recycling of the wash solution through said cation exchange copolymer, wherein the total amount of washing solution is continuously or intermittently cyclically circulated from the washing area through the separate area with the cation exchange copolymer and then back to the washing area at least five times during the cleaning process, and where the amount of the cation exchange copolymer is so selected that the residual hardness of the filtered washing solution is less than 20 mg CaO/liter.

4,120,654

ALKYNOXYMETHYL AMINES AS CORROSION INHIBITORS

Patrick M. Quinlan, St. Louis, Mo., and Richard D. McBride, Arlington, Tex., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 496,145, Aug. 9, 1974, Pat. No. 4,026,807. This application Dec. 29, 1976, Ser. No. 755,420

Int. Cl.[2] C23F *9/00, 9/02, 11/10*; C23G *1/02*

U.S. Cl. 422—16 **7 Claims**

1. A process of inhibiting corrosion of metals in contact with aqueous or oil-based acid systems which comprises adding to said system a small amount effective to inhibit the corrosion of said metals of a compound of the formula

$$RN(CH_2\text{-}OR')_2$$

where R is a hydrocarbon group and R′ is an acetylenic moiety.

4,120,655

METHOD FOR THE INHIBITION OF CORROSION OF FERROUS METALS IN AN AQUEOUS MEDIUM

Michel Crambes, Villette-de-Vienne; Henri Grangette, Lyon; Pierre Pivette, Sucy-en-Brie, and Philippe Haicour, Paris, all of France, assignors to Societe Nationale Elf Aquitaine, Paris, France

Filed Jul. 11, 1977, Ser. No. 814,652

Claims priority, application France, Jul. 13, 1976, 76 21471

Int. Cl.[2] C23F *11/12, 11/14, 11/16*

U.S. Cl. 422—15 **6 Claims**

1. A method for the inhibition of corrosion of ferrous metals in an aqueous medium consisting of adding to the aqueous medium from about 10 to 2000 ppm of a mixture consisting essentially of a water-soluble complex salt of a metal of groups II to VIII of the periodic table and of a hydrocarboxylic acid selected from the group consisting of tartaric, citric, maleic, gluconic and salicylic acids together with a phosphoric ester of an alkanolamine.

4,120,656

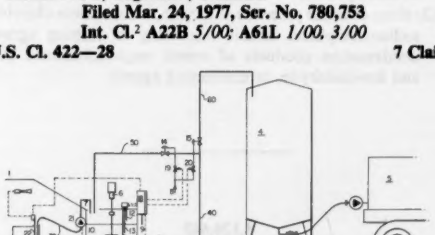
METHOD AND APPARATUS FOR COLLECTING MUCOSA

Bent Aage Henningsen, Holte, Denmark, assignor to Novo Industri A/S, Bagsvaerd, Denmark

Filed Mar. 24, 1977, Ser. No. 780,753

Int. Cl.[2] A22B *5/00*; A61L *1/00, 3/00*

U.S. Cl. 422—28 **7 Claims**



1. An apparatus for collecting and stabilizing intestinal mucosa or a like material which comprises:

a. a collecting tank into which the intestinal mucosa is introduced;

b. a preservative reservoir from which preservative is intermittently metered into the collecting tank; and

c. a storage reservoir into which preserved intestinal mucosa is intermittently transferred; said apparatus further comprising transfer means connecting said collecting tank, preservative reservoir and storage reservoir and controller means including a lower liquid level control and an

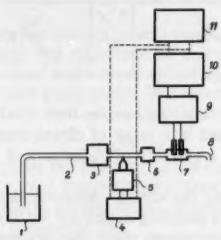
upper liquid level control inside the collecting tank; said controller means further including means actuated by said upper liquid level control for initiating transfer of the intestinal mucosa from the collecting tank to the storage reservoir when the level of intestinal mucosa inside the collecting tank reaches the upper level control and for halting such transfer when the level of intestinal mucosa inside the collecting tank declines to the level of the lower level control, and for metering preservative from the preservative reservoir into the collecting tank when the liquid level of intestinal mucosa declines to the level of the lower level control through transfer of intestinal mucosa to the storage reservoir.

4,120,657

PROCESS OF AND EQUIPMENT FOR THE ANALYSIS OF LIQUID SAMPLES BY TITRATION

Geza Nagy, Debrecen; Erno Pungor, Budapest; Klara Toth, Budapest; Jeno Havas, Budapest, and Zsofia Feher, Budapest, all of Hungary, assignors to EGYT Gyogyszervegyeszeti Gyar, Budapest, Hungary

Filed Apr. 18, 1977, Ser. No. 788,540
Claims priority, application Hungary, Apr. 20, 1976, EE 2421
Int. Cl.[2] B01K *3/00*; G01N *31/16*
U.S. Cl. 23—230 R **9 Claims**



1. A process for the selective analysis of flowing liquid samples, comprising flowing said liquid at a constant volume rate, feeding into the flowing liquid sample an amount of a reagent adequate to the measurement of the concentration of at least one constituent of the sample in a first period of time, and decreasing to zero the rate of flow of the reagent within a second predetermined period of time, during said first and second periods observing the changes occurring in the reaction mixture, and carrying out the determination of the concentration of said constituent of the liquid sample by comparing the time which elapses between the appearances of the two chemical equivalence points with calibration curves prepared with standard solutions, such elapsed time having a known functional relationship with the concentration of said constituent of the liquid sample.

4,120,658

METHOD AND APPARATUS FOR DETERMINATION OF DISSOCIATION OF OXYGEN FROM BLOOD

Stephen P. Bruttig, 9424 Grand Ave., Omaha, Nebr. 68134

Filed Nov. 11, 1976, Ser. No. 741,100
Int. Cl.[2] G01N *27/00, 33/16*
U.S. Cl. 23—230 B **6 Claims**

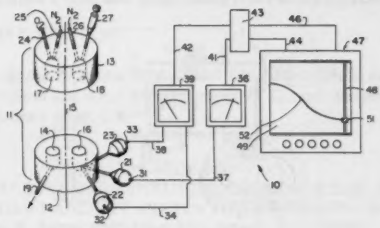
1. A method for determination of the dissociation of oxygen from blood comprising the steps of:

(a) providing a sample of blood having a partial pressure of oxygen equal to zero;

(b) placing an oxygen atmosphere of at least 97% oxygen above, and in contact with, the surface of said sample of blood;

(c) simultaneously monitoring the changes in the pH and partial pressure of oxygen in the liquid phase and not the gaseous phase in said sample of blood as the oxygen is absorbed, said monitoring including the production of a continuous curve of increasing liquid phase partial pressure of oxygen v. decreasing pH from desaturation to saturation of said sample of blood with oxygen; and

(d) analyzing said curve to determine the partial pressure of



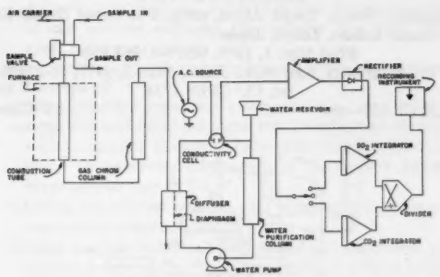
oxygen at 50% saturation by intersecting said curve with a horizontal line beginning at a point ½ the distance between saturation and desaturation and then vertically expanding the point of intersection to determine the partial pressure of oxygen.

4,120,659

SULFUR ANALYSIS

Wendell P. Cropper, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jul. 7, 1977, Ser. No. 813,692
Int. Cl.[2] G01N *27/06, 31/12*
U.S. Cl. 23—230 PC **5 Claims**



3. Apparatus for measuring the concentration of sulfur in a carbonaceous sample having oxidation means producing carbon dioxide and sulfur -containing gas, wherein the improvement comprises:

ratio means for taking the ratio of a quantitative signal generated from the sulfur -containing gas to a quantitative signal generated from the carbon dioxide.

4,120,660

METHOD AND APPARATUS FOR THE DETERMINATION OF OXIDATIVE STABILITY OF POLYMERS UNDER SHEAR CONDITIONS

Joseph Donnelly Trizisky, Amherstview, Canada, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

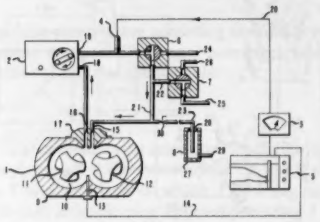
Filed Nov. 9, 1977, Ser. No. 849,934
Claims priority, application Canada, Nov. 9, 1976, 265588
Int. Cl.[2] G01N *27/00*
U.S. Cl. 23—230 R **18 Claims**

8. A method for determining the oxidative stability of polymers under shear conditions, said method comprising the steps of:

(a) heating polymer to a pre-selected temperature in the presence of a first gas that is inert with respect to the

polymer, said polymer being viscous or visco-elastic at the pre-selected temperature,

(b) replacing the inert gas with an oxygen-containing gas, said oxygen-containing gas being at atmospheric pressure, and



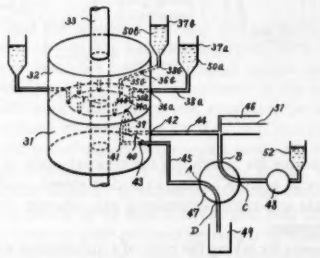
(c) while subjecting the polymer to shear measuring the amount of oxygen in the oxygen-containing gas over a period of time, the pressure of the oxygen-containing gas being maintained at atmospheric pressure by addition of a second gas that is inert with respect to the polymer.

4,120,661

SAMPLING DEVICE

Toyohiko Naono, Tokyo, Japan, assignor to Nihon Denshi Kabishiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1978, Ser. No. 882,450
Claims priority, application Japan, Mar. 3, 1977, 52-22990
Int. Cl.[2] G01N *1/14*
U.S. Cl. 422—68 **7 Claims**



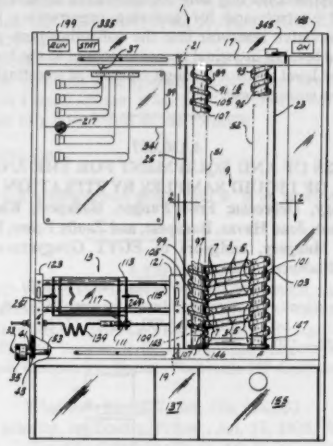
1. A sampling device comprising first and second valve bodies, said bodies having abutting faces in sliding contact and being movable relative one to the other, said first body having at least one sample holding duct which may be filled with sample, said sample holding duct opening through an internal sample outlet port in the abutting face of said first body, said second body having at least one pair of ducts each duct of said pair directly connected to an internal sample inlet port in the abutting face of the second body, means for bringing the ports into registration and moving them out of registration, at least one sampling pump connected to at least one duct in each said pair of ducts in the second body, said sampling pump arranged to draw the sample through internal outlet and internal inlet ports when they are in registration, said at least one pair of ducts in said second body connected such that the sample drawn may be discharged therefore when no ports are in registration.

4,120,662

SPECIMEN SAMPLING APPARATUS

Egil Fosslien, Tampa, Fla., assignor to Cortex Research Corporation, Tampa, Fla.

Filed Jan. 18, 1978, Ser. No. 870,453
Int. Cl.[2] G01N *1/14*
U.S. Cl. 73—425.6 **53 Claims**



1. Apparatus for obtaining samples from specimens of blood or the like contained in a series of closed containers, which specimens include a plurality of particles such as cells, comprising:

means for moving the closed containers along a predetermined path to a sampling station and for imparting motion to the closed containers while they are moved along the path to obtain a substantially uniform distribution of the particles contained therein; and

means for penetrating the closed containers when they reach the sampling station to withdraw specimen samples from said containers.

4,120,663

HYDROGEN GENERATING DEVICE

Jacques Fally, Orsay, France, assignor to Compagnie General d'Electricite S.A., Paris, France

Filed Aug. 12, 1976, Ser. No. 713,957
Claims priority, application France, Aug. 27, 1975, 75 26389
Int. Cl.[2] B01J *7/00*
U.S. Cl. 422—198 **14 Claims**

1. In a hydrogen generating device including:

a steam vessel comprising spaced first and second walls and including closure means closing off said walls and forming with said walls a steam decomposition chamber;

tube means for introducing steam into said steam vessel decomposition chamber;

furnace means for heating said steam within said steam vessel to a temperature sufficient to decompose at least some of said steam into hydrogen and oxygen, an oxygen passing membrane forming said second wall;

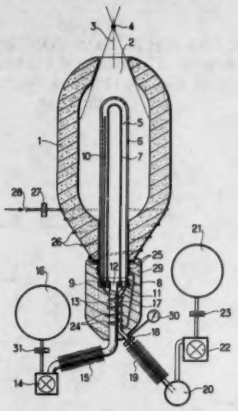
collector means exterior of said vessel and connected to said steam vessel for collecting hydrogen,

the improvement wherein:

said membrane comprises a double doped metallic oxide including a first doping to effect passage of oxygen ions through said membrane and a second doping different from said first doping to effect return conduction of electrons through said membrane, and wherein the amount of said second doping is sufficient keep the membrane in electronic equilibrium,

a third wall, said third wall and second second wall defining an oxygen collecting chamber;

vacuum pump means connected to said oxygen collection chamber for maintaining a reduced pressure on the side of



said membrane exterior of said vessel to cause oxygen to pass through said membrane for collection; and

means exterior of said oxygen collecting chamber and connected to said pump means for collecting oxygen.

4,120,664

PRODUCTION OF LOW-SULFUR COAL POWDER FROM THE DISINTEGRATION OF COAL

William K. T. Gleim, Seattle, Wash., assignor to Energy Modification, Inc., Gainesville, Fla.

Filed Oct. 13, 1977, Ser. No. 841,750

Int. Cl.[2] C10L *9/10*; C10G *1/00*

U.S. Cl. 44—1 R **10 Claims**

1. A method for producing a low ash-low sulfur content coal dust from small lumps of dry coal, which comprises,

(a) mixing macro-sized coal lumps with a liquid SO_2 stream within a confined reaction zone and passing the mixture upwardly therein while at a temperature and elevated pressure sufficient to maintain the SO_2 in liquid phase to provide for a resulting separation of the lump coal into micro-sized coal particles and residue material,

(b) withdrawing floating and suspended coal particles and liquid from the upper portion of the reaction zone and passing the mixture to a separation zone while still under superatmospheric pressure to provide for the separation of the micro-sized coal from the liquid SO_2 and resulting extracted hydrocarbons,

(c) discharging and recovering the fine micro-sized particles as a desired low ash-low sulfur coal dust, and

(d) recovering the separated liquid SO_2 stream from said separation zone for recycle to said reaction zone.

5. The method of claim 1 further characterized in that the liquid SO_2 stream may comprise a mixture of hydrocarbons selected from the group of aromatics, dienes, and the combination thereof, wherein the hydrocarbon portion of the stream is not greater than about 60% of such stream.

4,120,665

PROCESS FOR IMPROVING COAL

James K. Kindig, Arvada, and Ronald L. Turner, Golden, both of Colo., assignors to Hazen Research, Inc., Golden, Colo.

Filed Jan. 21, 1977, Ser. No. 761,307

Int. Cl.[2] C10L *9/10*; C10B *57/00*

U.S. Cl. 44—1 R **42 Claims**

28. In a process for improving coal wherein raw coal is treated with iron carbonyl in order to enhance the magnetic susceptibility of one or more impurities, thereby permitting the removal of these impurities by magnetic separation, the improvement comprising:

pretreating the coal by heating it to at least a temperature for at least a period of time sufficient to essentially meet or exceed a time and temperature relationship expressed as:

$$D \geqq K(50/T-90)^3$$

wherein D is time in hours and T is temperature in degrees Celsius and is not less than about 95° C., and wherein K is at least about 0.5.

4,120,666

HOLLOW CORE SYNTHETIC FIREPLACE LOG AND METHOD AND APPARATUS FOR PRODUCING SAME

Steven R. Lange, 8355 Quay Dr., Arvada, Colo. 80003

Filed Jun. 21, 1976, Ser. No. 698,259

Int. Cl.[2] C10L *5/00, 5/36, 5/22*

U.S. Cl. 44—10 R **21 Claims**

5. An apparatus for fabricating synthetic fireplace logs by a continuous extrusion process, comprising:

an open-ended compaction chamber adapted for receiving raw material in one end and continuously extruding said raw material in a compacted state out its opposite end,

a compactor associated with said one end of said compaction chamber capable of continuously feeding a dry, raw material into said one end of said compaction chamber,

wax delivery means in said compaction chamber for uniformly impregnating said compacted raw material with hot, molten wax as said raw material continuously advances through said compaction chamber; and

a cooling area in said compaction chamber for cooling said mixture of raw material and molten wax, thereby resulting in said mixture acquiring the integrity of a hard, rigid synthetic log structure.

12. A method of producing synthetic fireplace logs, comprising the steps of:

feeding shredded paper into a compactor;

compacting said shredded paper into an elongated chamber with an opening at each end and with an inside cross-sectional configuration conforming to the desired finished shape of said log;

injecting hot, molten wax into said compacted paper in said compaction chamber; and

cooling and hardening said wax while said paper and wax mixture is still in said compaction chamber to form a solid, homogenous member.

4,120,667

ISOLATION OF PURE AMMONIA FROM GAS MIXTURES CONTAINING AMMONIA AND CARBON DIOXIDE

Hans Gettert, Mannheim; Hermann Dieter Fromm, Gruenstadt; Martin Molzahn, Ludwigshafen; Ernst-Juergen Schier, Bad Durkheim, and Hans Henning Schneehage, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 12, 1977, Ser. No. 841,552

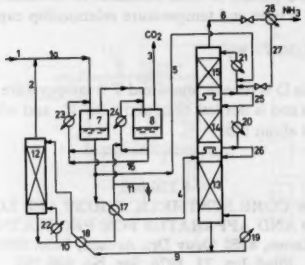
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1976, 2646804

Int. Cl.[2] B01D *53/14*

U.S. Cl. 55—48 **10 Claims**

1. A process for isolating ammonia from gas mixtures containing ammonia and carbon dioxide by partially absorbing the gas mixture in a solvent, with intimate mixing and using residence times of at most 0.1 second, then separating the non-absorbed gas mixture and the solution obtained, and desorbing the solution containing excess ammonia, wherein, in a first desorption stage, only the ammonia present in an excess over a molar ratio of 3 parts of ammonia to 1 part of carbon dioxide is expelled by heating and the entrained carbon dioxide is

washed out of the expelled ammonia with solutions which contain free ammonia, the residual solution from the first desorption stage is substantially freed from ammonia and carbon



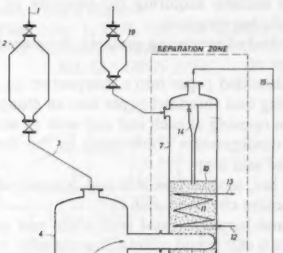
dioxide in a second desorption stage, the expelled solvent-containing gas together with fresh gas mixture is recycled to the absorption and the solvent obtained from the second desorption stage is employed as solvent in the absorption.

4,120,668

METHOD FOR REMOVING ENTRAINED MELT FROM A GASEOUS STREAM

Lowell David Fraley, Sugarland, Tex., assignor to Pullman Incorporated, Chicago, Ill.

Continuation-in-part of Ser. No. 698,236, Jun. 21, 1976, abandoned. This application May 16, 1977, Ser. No. 797,264
Int. Cl.[2] B01D *49/00*
U.S. Cl. 55—72 **10 Claims**



1. A process for removal of entrained melt from a gaseous stream comprising:

(a) maintaining solid, particulate material in a separation zone at a temperature below the temperature of the gaseous stream;

(b) passing the gaseous stream containing entrained melt upwardly through the solid, particulate material at a sufficient velocity to fluidize the material;

(c) solidifying the entrained melt on the fluidized, solid, particulate material in the separation zone by maintaining the solid particulate material at a temperature below the condensation temperature of the entrained melt to form coated particulate material;

(d) removing at least a portion of the coated particulate material from the separation zone;

(e) adding clean solid, particulate material to the separation zone; and

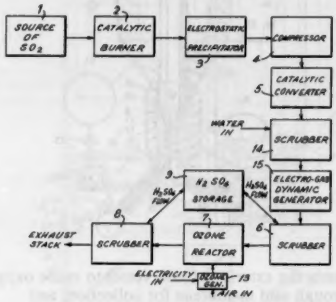
(f) withdrawing a cleaned gaseous stream from the separation zone.

4,120,669

WASTE GAS POLLUTION CONTROL SYSTEMS

Steven C. Amendola, 11 Thornwood Pl., Scarsdale, N.Y. 10583

Filed Apr. 25, 1977, Ser. No. 790,575
Int. Cl.[2] B01D *53/14*
U.S. Cl. 55—73 **3 Claims**



1. A method for removing sulfur oxides from waste gases, said method comprising:

(a) converting substantial amounts of sulfur dioxide present in said waste gases to sulfur trioxide in the presence of a catalyst;

(b) scrubbing the product resulting from step (a) with H_2SO_4 so as effectively to remove substantial amounts of the converted sulfur trioxide, such that the unconverted gases remaining have a reduced sulfur dioxide content of approximately 300 ppm;

(c) reacting the unconverted gases resulting from the operations of steps (a) and (b) with ozone, thereby to convert substantially all of the sulfur dioxide remaining in the unconverted gases to sulfur trioxide;

(d) scrubbing the gas mixture resulting from step (c) so as to remove the sulfur trioxide, whereby the sulfur dioxide content of the waste gases is reduced to approximately 100 ppm; and

(e) further comprising the steps of additionally scrubbing the gas mixture resulting from the catalytic conversion step (a) with water, and producing electric power by passing the sulfuric acid mist resulting from the additional scrubbing operation through an electric field developed in an electro-gas dynamic generator.

4,120,670

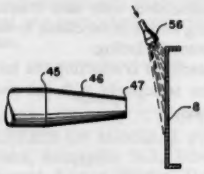
POLLUTION CONTROL APPARATUS AND METHOD

Ladislav J. Pircon, 305 Canterberry La., Oak Brook, Ill. 60521

Continuation-in-part of Ser. No. 632,648, Nov. 17, 1975, Pat. No. 4,036,609, which is a continuation-in-part of Ser. No. 252,914, May 12, 1972, Pat. No. 3,920,422, which is a continuation-in-part of Ser. No. 190,248, Oct. 18, 1971, Pat. No. 3,853,506. This application Jul. 18, 1977, Ser. No. 816,677
The portion of the term of this patent subsequent to Dec. 10, 1991, has been disclaimed.
Int. Cl.[2] B01D *47/00*
U.S. Cl. 55—90 **15 Claims**

1. A process having a pressure drop of about 0.4 to 8 inches of water for removing particulate matter from gas streams comprising passing said gas stream having particulate matter therein through the entry of a nozzle; accelerating the gas stream through a converging portion of said nozzle having a mean angle of convergence of about 4° to 8° providing outlet

velocities of about 2 to 12 times the entrance velocity; passing said particulate-containing gas stream from the nozzle outlet through an expansion zone decelerating the gas, said acceleration and deceleration of the gas stream causing particulates to agglomerate; impinging said agglomerates and particulates



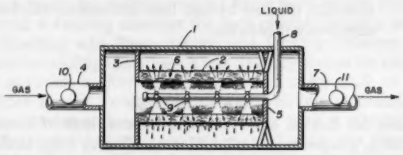
upon a fixed flat surface of substantially imperforate material thereby separating said particulates and agglomerates from said gas stream; removing said particulates and agglomerates from the expansion zone; and separately removing clarified gas from the expansion zone.

4,120,671

SEPARATION OF AEROSOLS FROM GASES IN A HORIZONTALLY DISPOSED CYLINDRICAL FIBER BED

Daniel E. Steinmeyer, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jun. 7, 1976, Ser. No. 693,601
Int. Cl.[2] B01D *46/04*
U.S. Cl. 55—96 **27 Claims**



1. In a process for removing a liquid from a moving gas stream in a separator by flowing said liquid containing gas through at least one cylindrical fiber bed element contained in said separator, each of said at least one cylindrical fiber bed element comprising a non-matting bed of randomly distributed fibers having a mean diameter of at least about 5 microns packed to a substantially uniform bed voidage of from about 85 to 98% within the annular space between two substantially concentric cylindrical screens to provide a hollow core in said at least one cylindrical element, said flow resulting in separation of a substantial proportion of the liquid from the gas as a collected liquid phase, the improvement comprising:

(a) causing said liquid containing gas to flow through each of said at least one cylindrical element from the core side thereof outwardly while each of said at least one cylindrical element is oriented with its longitudinal axis at an angle of from about 0° to 30° from the horizontal, the fiber bed in each of said at least one cylindrical element being such that (i) it is operating under non-flooding conditions for the liquid loading contained in the gas and (ii) the residual saturation of said fiber bed against gas phase drag of the liquid phase is less than the residual saturation of said fiber bed against gravity drainage of the liquid phase, and

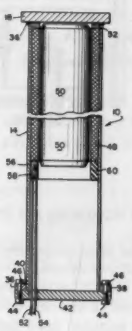
(b) continuously draining the collected liquid phase from the outer circumference of each of said at least one cylindrical element.

4,120,672

RAPPER ASSEMBLY FOR ELECTROSTATIC PRECIPITATORS

Philip M. Lanese, Belle Mead, N.J., assignor to Belco Pollution Control Corporation, Parsippany, N.J.

Filed Dec. 30, 1976, Ser. No. 755,521
Int. Cl.[2] B03C *3/76*
U.S. Cl. 55—112 **5 Claims**



1. An electrode rapper assembly for electrostatic precipitators comprising:

a cylindrical cover;

a coil within said cover and concentric therewith;

an anvil rigidly connected with said cover;

a ferro-magnetic plunger movably mounted within said coil and movable to strike said anvil;

a first junction;

a second junction, said coil being connected between said first and second junctions;

a series solid state rectifier diode;

a parallel solid state rectifier diode;

a wire connecting one end of said parallel solid state rectifier diode with said first junction and another wire connecting the other end of said parallel rectifier diode to said second junction so as to be in parallel with said coil and permit current flow through said parallel rectifier diode so that it passes from said second junction through said parallel rectifier diode to said first junction;

two conductors for supplying rectified A. C. current,

one of said conductors being connected to one of said junctions, the other of said conductors being connected to one end of said series rectifier diode; and

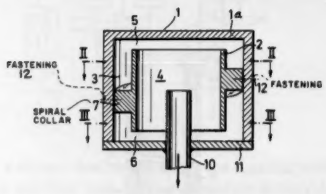
a wire connecting the other end of said series rectifier diode with the other of said junctions so that current passing through said series rectifier diode can pass only from said first junction to said second junction while passing through said coil;

whereby energizing current can flow through said coil to generate a magnetic field and move said plunger upward and interruption of said energizing current will permit said plunger to drop, the current induced in said coil upon said interruption flowing through said second junction, said parallel rectifier, said first junction and said coil until dissipated.

4,120,673
APPARATUS FOR SEPARATING GASES FROM LIQUIDS

Achim zur Nieden, Cologne, Fed. Rep. of Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Feb. 18, 1977, Ser. No. 769,924
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1976, 2606673
Int. Cl.[2] B01D *45/16*
U.S. Cl. 55—205 2 Claims



1. An apparatus for separating gas from a fluid, which comprises in combination:

a hollow cylindrical receptacle, the ends of which respectively comprise cover means;

a hollow cylindrical insert located within said receptacle and in spaced relationship thereto so as to define respective first and second annular gaps axially above and axially below between the end portions of said insert and said cover means and so as to divide the interior of said receptacle into an annular outer section and a cylindrical inner section, said outer section being provided with a tangentially oriented inlet positioned therein for receiving said fluid and a tangentially oriented outlet positioned in the lower portion of the outer section below the inlet for withdrawing said fluid in a uniform rotating film on the inner wall of said insert to facilitate and reinforce removal of gas supplemental to centrifugal forces from below at said second annular gap;

a spirally ascending collar in said outer section and interposed between the inner wall of said receptacle and the outer circumference of said insert, said collar comprising a guiding surface thereon communicating with said inlet and following the spiral contour of said collar, said collar ascending upwardly in the direction of said first gap located axially there above and communicating therewith; and

ventilating means communicating with said insert for withdrawing said gas from said receptacle with improved separation of gas from the fluid.

4,120,674
FILTERING ARRANGEMENT FOR VACUUM LOADERS

Franz Haag, Isny, Allgaü, and Paul Bongartz, Isny-Kleinhaslach, both of Fed. Rep. of Germany, assignors to Motan Gesellschaft mit beschrankter Haftung, Isny, Allgau, Fed. Rep. of Germany

Filed Jun. 9, 1977, Ser. No. 805,000
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1976, 2625734
Int. Cl.[2] B01D *46/04*
U.S. Cl. 55—302 7 Claims

1. A filtering arrangement for vacuum loaders, for filtering, conveying and cleaning operations, particularly for pulverous materials, which comprises in combination:

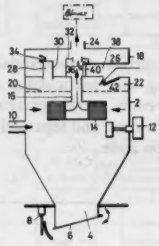
a filtering container having an inner wall;

a cylindrical conveying filter arranged within said filtering container having inlets and outlets arranged in such a way as to convey air to be withdrawn from said filtering container radially through said conveying filter;

a scavenging air filter arranged within said filtering container and above said conveying filter, said scavenging air filter forming a scavenging air chamber with a portion of said inner wall of said filtering container, said scavenging air filter being in the form of a diaphragm and being arranged for passing air vertically therethrough, a blower means connected in communication with the scavenging air chamber and operable selectively; and

cover means associated with said filtering container and having opening means connectable to said blower means, said cover means including:

first valve means for connecting the interior of said conveying filter selectively with the suction side of said blower means,



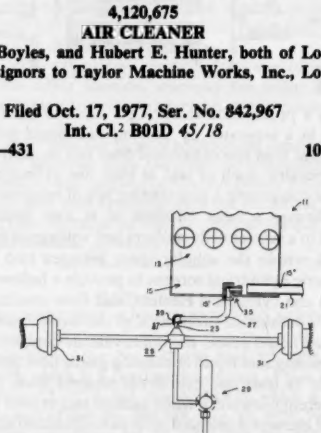
second valve means for connecting the interior of said conveying filter selectively with outside air during the cleaning operation in a flow direction radially of said conveying filter, and

third valve means for connecting said scavenging air chamber selectively with the suction of said blower means during the cleaning operation of said conveying filter in opposite counter flow radial direction from inside to outside due to selective instant reversal of flow direction effected by said first and second valve means selectively therewith.

4,120,675
AIR CLEANER

Tonnie M. Boyles, and Hubert E. Hunter, both of Louisville, Miss., assignors to Taylor Machine Works, Inc., Louisville, Miss.

Filed Oct. 17, 1977, Ser. No. 842,967
Int. Cl.[2] B01D *45/18*
U.S. Cl. 55—431 10 Claims



1. An improved air cleaner system of the type including

separator means for separating particulate material from air before the air passes into the air intake of an internal combustion engine and including a bin for receiving and containing any particulate material so separated, wherein said improvement comprises: means for coupling the exhaust port of a pressurized air brake system to said bin to allow the pressurized air expelled from said brake system when said brake system is activated and subsequently deactivated to pass through said bin and expel any particulate material contained within said bin therefrom.

4,120,676

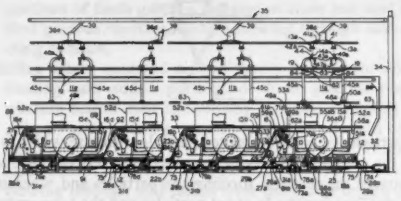
METHOD AND APPARATUS FOR PRODUCING BLANKETS OF MINERAL FIBERS

William Peter Hahn, Somerville, N.J.; Edward Lee Hite, Toledo, Ohio; Donald Eugene Shisler, Defiance, Ohio, and Charles Donald Simmers, Bowling Green, Ohio, assignors to Johns-Manville Corporation, Denver, Colo.

Filed Mar. 20, 1972, Ser. No. 236,372

Int. Cl.[2] C03B *37/04*

U.S. Cl. 65—4 R **22 Claims**



1. Apparatus for the production of mineral fiber mats comprising a plurality of mat forming modules arranged in an in-line orientation; fiber issuing means for each module comprising means for making mineral fibers from molten mineral material; a forming chamber for each of said modules; means for directing said fibers toward said forming chamber and means for cooling said fibers; a mat delivery station for each of said modules; a fiber collecting conveyor for each of said modules in said forming chamber and having a foraminous fiber receiving surface adapted to collect fiber in mat form in said forming chamber and to convey said mat in the direction of said in-line orientation from said forming chamber to said mat delivery station; means for applying binder to said fibers before said fibers are conveyed from said forming chamber to said mat delivery station; a suction box in communication with said forming chamber through said fiber collecting conveyor; said mat delivery stations of respective modules being spaced apart in said in-line orientation; and a transfer conveyor located beneath said delivery stations and arranged to advance horizontally adjacent a plurality of said spaced delivery stations in the direction of said in-line orientation and adapted to receive mat from the individual delivery stations at spaced locations along said conveyor and each of said delivery stations including means for superposing said mat on said transfer conveyor or on the mat delivered from at least one preceding delivery station.

4,120,677

METHOD FOR MAKING A GLASS-REACTED-CERAMIC

Ian Burn, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

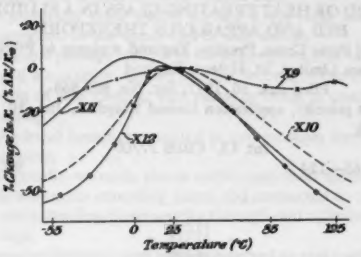
Filed Oct. 26, 1976, Ser. No. 735,656

The portion of the term of this patent subsequent to Jan. 3, 1995, has been disclaimed.

Int. Cl.[2] C03B *23/20, 32/00*; H01B *3/00*; C03C *21/00*

U.S. Cl. 65—18 **6 Claims**

1. A method for making a glass-reacted-ceramic body having a high dielectric constant at 25° C. comprising mixing in a suspension medium the three finely ground prefired powders consisting essentially of a powder of barium titanate, powders of an alkaline-earth-zirconate and powder of a cadmium containing glass; forming a body of said powdered mixture; and



firing said body between 1800° F. and 2050° F. to react said titanate powder with said zirconate powder and to form an alkaline-earth-titanate-zirconate phase that is intermixed with a glass phase.

4,120,678

SEALING GLASS VEHICLE AND COMPOSITION AND METHOD FOR MAKING SAME

Josef Francel; James E. King, both of Toledo, and John M. Woulbroun, Grand Rapids, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 637,351, Dec. 3, 1975, Pat. No. 4,038,091, which is a division of Ser. No. 516,900, Oct. 22, 1974, Pat. No. 3,973,975, which is a continuation-in-part of Ser. No. 246,316, Apr. 21, 1972, abandoned, and a continuation-in-part of Ser. No. 511,202, Oct. 1, 1974, Pat. No. 3,967,973, which is a continuation of Ser. No. 246,316,. This application Jun. 27, 1977, Ser. No. 810,150

Int. Cl.[2] C03C *27/00*

U.S. Cl. 65—32 **4 Claims**

1. In a method of sealing two glass surfaces together with a paste of PbO-containing sealing glass frit in the presence of reducing conditions in such manner as to prevent the tendency of the PbO to be reduced and a dielectric breakdown to occur in the seal formed between said glass surfaces, the improvement wherein said PbO in said sealing glass frit remains unreduced in the presence of said reducing conditions and said dielectric breakdown is prevented, said improvement comprising incorporating an effective amount of BaO_2 powder in said paste.

4,120,679

PRODUCTION OF SEMI-REFLECTING GLASS PRODUCTS

Daniel Philibert, Louveciennes, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Jun. 15, 1977, Ser. No. 806,666

Claims priority, application France, Jun. 15, 1976, 76 18154

Int. Cl.[2] C03C *17/00*

U.S. Cl. 65—60 B **11 Claims**

1. The process of producing semi-reflecting glass products by forming a metal oxide coating thereon comprising applying to at least a portion of one surface of said product a solution of at least one charge-transfer complex in a non-aqueous organic solvent therefor, said product having been heated prior to said application to a temperature sufficient to evaporate said solvent and cause pyrolysis of said charge-transfer complex, and said charge-transfer complex having the general formula MeX_mY_n where Me is a polyvalent heavy metal or metalloid, X is at least one beta-diketone radical having no more than 10 carbon atoms, Y is at least one beta-diketone radical having no more than 10 carbon atoms and differing from X; or one of X

or Y can be at least one halogen radical, and *m* and *n* equal the valence of Me.

4,120,680

METHOD OF HEAT TREATING GLASS IN A FLUIDIZED BED AND APPARATUS THEREFORE

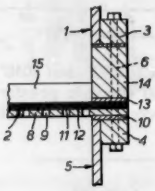
Raymond Peter Cross, Preston, England, assignor to Pilkington Brothers Limited, St. Helens, England

Filed Jun. 10, 1977, Ser. No. 805,568

Claims priority, application United Kingdom, Jun. 10, 1976, 24124/76

Int. Cl.[2] C03B *27/00*

U.S. Cl. 65—114 **9 Claims**



1. In a method of thermally treating a glass article by immersing the article in a fluidised bed of particulate material in a quiescent uniformly expanded state of particulate fluidisation, which bed has a tranquil top surface through which the article is lowered as it is immersed in the bed, the improvement comprising:

establishing a high pressure drop in the fluidising gas flow across a porous membrane through which fluidising gas is supplied to the bed uniformly over the whole of the base of the bed, said high pressure drop being at least 60% of the pressure at which the fluidising gas is supplied beneath the membrane and being sufficient to produce a uniform distribution of fluidising gas flow upwardly from the upper face of the porous membrane through the depth of the fluidised bed to maintain the bed stable in said quiescent state of fluidisation.

5. Fluidised bed apparatus comprising:

a container for the fluidised bed;

a plenum chamber;

means for supplying fluidising gas to the plenum chamber; and

a membrane separating the container from the plenum chamber and having an upper surface which forms the whole base of the container, which membrane comprises a perforated rigid member supporting a plurality of layers of material having a low permeability to gas flow such that the pressure drop in the fluidising gas flow across the membrane is at least 60% of the pressure at which fluidising gas is supplied to the plenum chamber, and the upper surface of which membrane produces a uniform distribution of fluidising gas flow upwardly through the fluidised bed.

4,120,681

METHOD OF THERMAL TREATMENT OF GLASS IN A FLUIDIZED BED

Raymond Peter Cross, Preston, and Derek Edward Thomas, Chester, both of England, assignors to Pilkington Brothers Limited, St. Helens, England

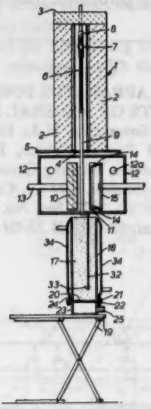
Continuation of Ser. No. 717,263, Aug. 24, 1976, abandoned. This application Nov. 8, 1977, Ser. No. 849,631

Claims priority, application United Kingdom, Aug. 29, 1975, 35770/75; Jun. 10, 1976, 24123/76

Int. Cl.[2] C03B *27/00*

U.S. Cl. 65—114 **18 Claims**

1. A method of thermally treating glass in which the glass is contacted with a gas-fluidised particulate material placed in a quiescent uniformly expanded state of particulate fluidisation by gas fed to the particulate material under pressure from an external source, with control of the gas feed being such that the gas velocity while the glass is being contacted by said particulate material is between the velocity corresponding to incipient fluidisation and that velocity corresponding to maximum expansion, wherein the particulate material is comprised of buoy-



ant particles of non-compacted particle structure which is such that the apparent density of the particles is less than the actual density of the material forming the particles and wherein the material forming the buoyant particles and the temperature of the material are so selected that the heat transfer coefficient of the fluidised material is sufficient to produce a desired thermal treatment of the glass at it cools in the material.

4,120,682

INSTALLATION FOR SUPERFICIALLY TREATING THE OUTER SURFACES OF BOTTLES

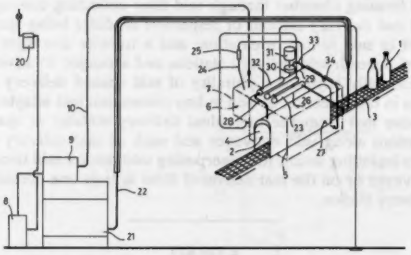
Maurice R. G. Galanti, Ransart, Belgium, assignor to Institut National du Verre, Charleroi, Belgium

Filed Dec. 5, 1977, Ser. No. 857,713

Claims priority, application Belgium, Mar. 25, 1977, 0176141

Int. Cl.[2] C03C *17/00*

U.S. Cl. 65—181 **6 Claims**



1. An installation for superficially treating the outer surfaces of glass bottles which are already shaped but not yet annealed, said installation comprising:

a tunnel,

an inlet for the bottles in said tunnel,

an outlet for said bottles in said tunnel,

means for longitudinally displacing said bottles into said tunnel,

an evaporator,

means for supplying said evaporator with hot liquid reagent,

means for supplying said evaporator with a current of hot, filtered and dehydrated air,

at least one drop-by-drop feed member arranged into said evaporator for delivering said liquid reagent at an adjustable flow rate, whereby said current of air when traversing said tunnel evaporates said delivered liquid reagent in order to produce a gaseous reactive mixture containing said air and said gaseous reagent,

two lateral inlet openings at said inlet of said tunnel for admitting a flow of gaseous reactive mixture into said tunnel

a collector at said outlet of said tunnel for collecting said gaseous reactive mixture having traversed said tunnel

a recycling conduit extending from said collector to two derived conduits which open into said lateral inlet openings

a sucking fan provided in said recycling conduit for moving said gaseous reactive mixture through said recycling conduit and said derived conduits

a cooler mounted on said recycling conduit for cooling said gaseous reactive mixture,

a supply conduit extending from said evaporator to said recycling conduit for continuously introducing added portions of fresh gaseous reactive mixture into said recycled gaseous reactive mixture flowing through said recycling conduit,

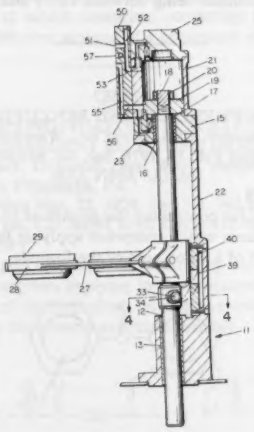
heating means mounted on said supply conduit for suitably heating said added portions of fresh gaseous reactive mixture before their introducing into said recycling conduit. so as to obtain a constantly thermically and chemically reconditionned gaseous reactive mixture formed by said both recycled and fresh gaseous reactive mixtures and flowing through said tunnel over the entire length of the path of said bottles and around said bottles to act thereon.

4,120,683

FUNNEL ARM OPERATING MECHANISM

George W. Irwin, Holland, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 1, 1977, Ser. No. 820,656
Int. Cl.[2] C03B *5/30, 9/40*
U.S. Cl. 65—207 6 Claims



1. In apparatus for forming hollow glass articles in which a parison forming mold is supplied with a charge of glass through the open, upper end of the parison mold and wherein the charge is guided by a funnel seated on the parison mold to guide the charge thereinto prior to forming the parison therein and the formed parison is then transferred to a blow mold where the parison is expanded into the final article shape, the improvement in the funnel-operating mechanism comprising:

a parison mold positioned at a parison station;

a vertically extending casting mounted adjacent said parison mold and supported by a section box;

a cylindrical fluid motor having a top and closing cap mounted to the upper end of said motor;

a vertical passage formed in the upper portion of said casting and a coaxially aligned passage formed in the lower portion of said casting, said passages being in coaxial alignment;

cylindrical bushings mounted in said passages formed in the casting;

a vertically movable piston within said fluid motor;

a downwardly extending piston rod connected to said piston and extending downwardly through said cylindrical bushings;

a semi-cylindrical cam plate connected to said casting intermediate the cylindrical bushings and spaced from said downwardly extending piston rod;

a radially extending cam follower connected to said piston rod, said follower engaging said cam plate;

a radially extending support arm fixed to said rod, said support arm being fixed to said rod immediately above the location of said cam follower, said arm supporting guide funnels;

a fixed support beam extending adjacent the upper end of said motor; and

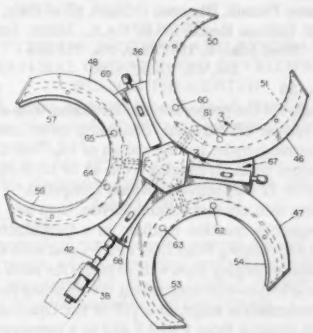
bracket means connected to, and extending between, said beam and the upper end cap of said motor to effectively immobilize the upper end of said motor.

4,120,684

MOLD RING TRANSFER APPARATUS

James D. Mallory, Maumee; John F. Fleck, Reynoldsburg, and Mario Cuniberti, Columbus, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed May 31, 1977, Ser. No. 801,687
Int. Cl.[2] C03B *19/04*
U.S. Cl. 65—302 4 Claims



1. In an apparatus for orienting and transferring a mold ring of a centrifugal mold for casting a hollow glass article such as a television tube funnel of a generally frusto-pyramidal configuration, wherein said apparatus is operated in an indexing mode between discrete stations, one of said stations requiring release of said mold ring to said centrifugal mold and another of said stations requiring removal of said mold ring from said centrifugal mold, the improvement which comprises:

a drive shaft driven in said indexing mode;

a support member housing attached to said drive shaft for rotation therewith, said support member having a plurality of cut out portions formed in its periphery, the number of said cut out portions being equal to the number of discrete stations;

a hollow, arcuate support finger holder attached to each of said cut outportions;

a pair of support fingers movably attached to each of said support finger holders and movable as a unit from a retracted position within said hollow support finger holders to a position beyond said support finger holder at least partially extending into the center of said arcuate support finger holder, whereby a mold ring is held when said support fingers are extended and released when said support fingers are retracted;

mechanical linkage means, carried by said support member housing, for interconnecting all of said pairs of support fingers to allow retraction of one pair of said support fingers and simultaneous extension of all of the rest of said pairs of support fingers when said mechanical linkage means is actuated, said mechanical linkage means including:

(a) an upper cage member attached to said support member housing, said upper cage member including upstanding sidewalls;

(b) a lower cage member attached to said upper cage member, thereby defining an open space between said upper and lower cage members;

(c) a shuttle positioned in said open space between said upper and lower cage members and movable within said open space;

(d) a plurality of connecting rods, equal in number to the number of said pairs of support fingers, connecting each pair of said support fingers to said shuttle; and

(e) means for driving said shuttle, to open and close said support fingers, in response to said means for actuating said mechanical linkage; and

means for actuating said mechanical linkage means in synchronism with the cycle of said apparatus.

4,120,685

PROCESS FOR THE PREPARATION OF UREA-FORMALDEHYDE CONDENSATES TO BE USED AS FERTILIZERS

Silvio Vargiu, Casatenova (Como); Giorgio Mazzoleni, Milan, and Silvestro Pezzoli, Biassono (Milan), all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Mar. 8, 1977, Ser. No. 775,684

Int. Cl.[2] C05C 9/00

U.S. Cl. 71—30 **12 Claims**

1. A process for the preparation of fertilizers with a slow and controlled release of nitrogen, consisting of condensates of urea with formaldehyde, having values of IA, Win and HWin (as hereinbefore defined) ranging from 48 to 58, from 20 to 24 and from 10 to 12 respectively, which comprises:

(a) bringing into contact formaldehyde, urea and methanol in an aqueous reaction medium in a formaldehyde/urea molar ratio ranging from 2.0:1 to 2.5:1 and with an amount of methanol ranging from 4 to 10 moles for each 100 moles of formaldehyde and condensing the resulting mixture in a first condensation stage, at a pH of the aqueous reaction medium ranging from 8 to 9.5 and at a temperature of 60 to 98° C., until a product having a viscosity from 15 to 30 sec. as measured at 25° C. in a Ford cup No. 4 is obtained;

(b) adding formic acid to the product obtained in (a) and condensing the resulting aqueous mixture in a second condensation stage, at a pH ranging from 4.0 to 5.5 and a temperature ranging from 60° to 98° C., until a product with a viscosity ranging from 35 to 45 sec. as measured at 25° C. in a Ford cup No. 4 is obtained;

(c) neutralizing the product obtained in (b) up to a pH ranging from 6.8 to 7.5;

(d) adding urea to the product obtained in (c) thereby to bring the formaldehyde/urea molar ratio to a value of from 0.6:1 to 0.75:1 and condensing the resulting aqueous mixture in a third condensation stage at a pH ranging from 5.7 to 6.8 and at a temperature ranging from 60° to 98° C., until a product with a viscosity ranging from 45 to 50 sec. as measured at 25° C. in a Ford cup No. 4 is obtained;

(e) heating the product obtained in (d) at a temperature ranging from 200° to 400° C. for a time ranging from 0.5 to 5 minutes and recovering the resulting solid fertilizer.

4,120,686

COMPOSITION FOR COMBATING SLIMES

Wilfried Paulus, and Hermann Genth, both of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

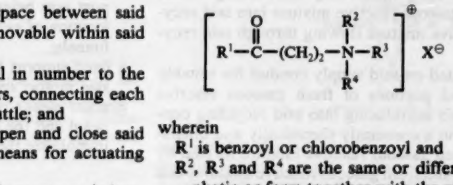
Filed Jun. 2, 1976, Ser. No. 692,171

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1975, 2528994

Int. Cl.[2] A01N 9/02

U.S. Cl. 71—67 **4 Claims**

1. Composition for combating slimes containing as the active compound combination, tetramethylthiuram disulfide and aroyl-ethyl ammonium salts of the formula



wherein

R^1 is benzoyl or chlorobenzoyl and

R^2, R^3 and R^4 are the same or different and are C_1–C_6 aliphatic or form together with the nitrogen atom, a heterocyclic group of 5 or 6 members in the ring or a monosubstituted or polysubstituted C_1–C_6 aliphatic or a heterocyclic ring formed together with said nitrogen atom said heterocyclic ring having 5 or 6 members wherein the substituent is fluorine, chlorine, bromine, iodine, a hydroxyl group, a nitro group, a C_1–C_6 alkyl radical, a C_1–C_6 halogen alkyl radical or a C_1–C_6 straight or branched alkoxy group, and

X is an anion of an inorganic or organic acid, the weight ratio of the aroyl-ethyl-ammonium salt to the tetramethylthiuram disulfide being between 1:0.01 and 1:99.

4,120,687

BENZOPHENONES AND BENZHYDROLS

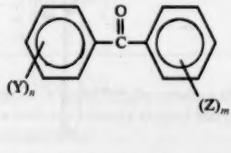
Robert H. Meisinger, 1005 Gerson Dr., Warminster, Pa. 18974

Filed Feb. 19, 1976, Ser. No. 659,609

Int. Cl.[2] A01N 5/00

U.S. Cl. 71—78 **6 Claims**

1. A method for controlling the growth of suckers in growing tobacco plants which comprises applying to the plants an effective aount of a compound of the formula



wherein

each Y and each Z independently is a halogen atom, a (C_1–C_8) alkyl group, a trifluoromethyl group, a (C_1–C_4) alkoxy group, a hydroxy group, a nitro group or a (C_1–C_4) alkylthio group,

m is 0, 1, or 2, and

n is 0, 1, 2, or 3.

4,120,688
METHOD OF INCREASING SUCROSE YIELD OF SUGARCANE

Geneva Gail Otten, c/o Sharon Woods Technical Center 1150 Reed Hartman Hwy., Cincinnati, Ohio 45241, assignor to The Proctor & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 673,315, Apr. 5, 1976, abandoned. This application Aug. 15, 1977, Ser. No. 824,468
Int. Cl.[2] A01N 9/36
U.S. Cl. 71—86 8 Claims

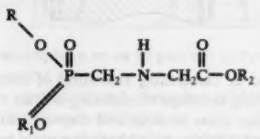
1. A method for increasing the sucrose yield of field grown sugarcane comprising applying to the cane at a time ranging from about 2 weeks to about 10 weeks prior to harvest aminomethylphosphonic acid in an amount ranging from about 0.1 pounds per acre to about 15 pounds per acre.

4,120,689
BENZYL AND ARYL ESTERS OF N-PHOSPHONOMETHYL GLYCINES, HERBICIDAL COMPOSITIONS AND USE THEREOF

Gerard A. Dutra, Ladue, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 644,406, Dec. 29, 1975, abandoned. This application Oct. 4, 1977, Ser. No. 839,244
Int. Cl.[2] A01N 9/36; C07F 9/09
U.S. Cl. 71—86 39 Claims

1. A compound of the formula



wherein R and R_1 are each selected from the group consisting of phenyl, benzyl, naphthyl, biphenylyl, benzyloxyphenyl and phenyl, benzyl or naphthyl groups substituted with from 1 to 3 groups selected from the class consisting of hydroxyl, lower alkyl, lower alkoxy, lower alkylthio, trifluoromethyl, carbo (lower alkoxy), nitro, or halo; and R_2 is a lower alkyl group, and the strong acid salts of such compounds.

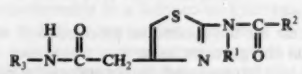
2. A method which comprises contacting a plant with a herbicidally effective amount of a compound of claim 1.

4,120,690
2-ACYLAMINOTHIAZOL-4-YLACETAMIDES AS POST-EMERGENT SELECTIVE HERBICIDES

Roger P. Cahoy, Overland Park, Kans., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Nov. 22, 1976, Ser. No. 743,542
Int. Cl.[2] A01N 9/12; C07D 417/04
U.S. Cl. 71—90 13 Claims

1. The method of selectively combating unwanted vegetation which comprises applying to the unwanted vegetation in the presence of the crop plants an effective amount of a compound having the general structural formula



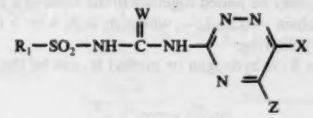
in which R^1 is hydrogen or lower alkyl, R^2 is amino, lower alkyl, lower chloroalkyl, lower alkylamino, lower alkenylamino, lower alkoxy or C_3 to C_5 cycloalkyl and R^3 is phenyl, thiazolyl, thiadiazolyl or lower alkyl-substituted, halogen-substituted or trifluoromethyl-substituted phenyl, thiazolyl or thiadiazolyl.

4,120,691
HERBICIDAL SULFONAMIDES

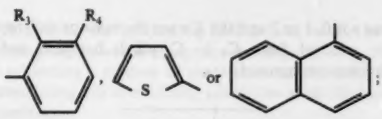
George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 769,912, Feb. 23, 1977, abandoned, which is a continuation-in-part of Ser. No. 674,668, Apr. 7, 1976, abandoned. This application Sep. 1, 1977, Ser. No. 829,823
Int. Cl.[2] C07D 253/06; A01N 9/16
U.S. Cl. 71—93 55 Claims

1. A compound having the formula:



wherein
R_1 is



R_3 is hydrogen, fluorine, chlorine, bromine, nitro, methyl or methoxy;
R_4 is hydrogen, fluorine, chlorine, bromine, methyl or methoxy;
W is oxygen or sulfur;
X and Z are independently hydrogen, methyl or methoxy; or an agriculturally suitable salt thereof;
provided that X and Z may not be hydrogen simultaneously.

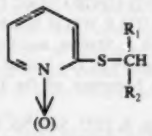
12. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim 1 and at least one of the following: surfactant, solid or liquid diluent.

4,120,692
THIO PYRIDINE N-OXIDES AND REGULATION OF THE NATURAL GROWTH AND DEVELOPMENT OF PLANTS THEREWITH

Howard L. Plant, Milford; John W. Zukel, Hamden, and Ronald B. Ames, Naugatuck, all of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 677,660, Apr. 16, 1976, Pat. No. 4,050,921. This application Jul. 20, 1977, Ser. No. 817,302
Int. Cl.[2] A01N 9/22
U.S. Cl. 71—94 13 Claims

1. A method of regulating the natural growth or development of plants which comprises applying to said plants an effective non-herbicidal plant-regulating amount of a 2-thiopyridine N-oxide compound of the formula



wherein:
R_1 is hydrogen, C_1 to C_{15} alkyl, alkenyl or benzyl;
R_2 is hydrogen,
C_1 to C_{12} alkyl,
C_1 to C_4 alkenyl,
C_2 or C_3 alkoxycarbonyl,
C_5 or C_6 alicyclic,

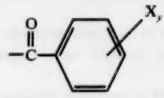
phenyl provided R_1 is not phenyl,

phenyl substituted with from 1 to 3 substituents which may be the same or different and are selected from the group consisting of C_1 to C_3 alkyl, halogen, cyano, nitro, C_1 or C_2 alkoxy, phenoxy, dioxymethylene and 2,2-dichlorocyclopropyl; and phenyl substituted with 4 to 5 substituents which may be the same or different and are selected from methyl and chlorine;

1-methyl-2,2-dichlorocyclopropyl, 2,2-dichlorocyclopropyl, naphthyl, 9-anthryl, 5-indanyl, 4-biphenylyl, 2-benzothiazolyl, 2-thienyl or benzyl;

R_1 and R_2 may be joined together in the form of a polymethylene chain $-(CH_2)_m-$ where m is 3, 4 or 5 to form a carbocyclic ring;

and when R_1 is hydrogen or methyl R_2 can be the radical



where y is 0, 1 or 2 and the X's are the same or different and are selected from C_1 to C_3 alkyl, halogen, and 2,2-dichlorocyclopropyl.

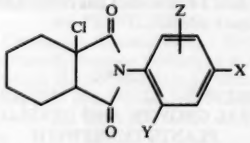
4,120,693

SUBSTITUTED ISOINDOLES

Steven Jerome Goddard, West Grove, Pa., and George Levitt, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 29, 1976, Ser. No. 709,820
Int. Cl.[2] A01N 9/22; C07D 209/34
U.S. Cl. 71—96 **24 Claims**

1. A compound of the formulae



wherein X is H, F, Cl, Br, CN, NO_2 or OCH_3; Y is H, F or CH_3; and Z is H, F, Cl, Br or OCH_3 provided that

(1) when Y is CH_3, X is F, Cl or Br;

(2) when Z is 6-Cl or 6-Br, Y is F; and,

(3) X, Y and Z may not all be H simultaneously.

4,120,694

PROCESS FOR PURIFYING A TITANIUM-BEARING MATERIAL AND UPGRADING ILMENITE TO SYNTHETIC RUTILE WITH SULFUR TRIOXIDE

Gerald W. Elger; Ruth A. Stadler, and Philip E. Sanker, all of Albany, Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Sep. 6, 1977, Ser. No. 830,523
Int. Cl.[2] C22B 1/06, 7/04
U.S. Cl. 75—1 T **13 Claims**

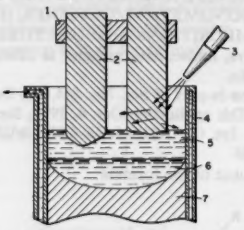
1. A process for removing alkaline earth oxide impurities from a titania slag consisting essentially of reacting said slag with sulfur trioxide gas at a temperature of about 600° to 1100° C to form a reaction product containing alkaline earth sulfates, and subsequently leaching said sulfates from the reaction product with water.

4,120,695

PROCESS OF THE ELECTROSLAG REMELTING OF CONSUMABLE ELECTRODES

Boris Evgenievich Paton, ulitsa Kotsjubinskogo, 9, kv. 21; Boris Izrailevich Medovar, bulvar Lesi Ukrainki, 2, kv. 8; Leonid Mikhailovich Stupak, Brest-Litovsky prospekt, 39, kv. 9; Viktor Mikhailovich Baglai, ulitsa Semashko, 10, kv. 54; Alexei Georgievich Bogachenko, ulitsa Miljutenko, 15/2, kv. 141, all of Kiev; Sergei Sergeevich Kazakov, N-Dnepropetrovskaya ulitsa, 14a, kv. 39, Zaporozhie, and Anatoly Konstantinovich Tsykulenko, ulitsa Babushkina, 23, kv. 38, Kiev, all of U.S.S.R.

Continuation of Ser. No. 551,409, Feb. 20, 1975, abandoned, which is a continuation of Ser. No. 474,145, May 28, 1974, abandoned, which is a continuation of Ser. No. 251,736, May 9, 1972, abandoned. This application Feb. 15, 1977, Ser. No. 768,741
Int. Cl.[2] C22D 7/00
U.S. Cl. 75—10 C **3 Claims**



1. A method of electroslag remelting of consumable electrodes comprising the steps of: securing at least two electrodes having dissimilar cross sections and shapes in a common electrode holder; establishing a slag bath in a mold cavity; immersing the end surfaces of the consumable electrodes to an equal depth in the slag bath; progressively melting the consumable electrodes and forming a metal bath in the cavity of the mold under the slag bath, the consumable electrodes melting at different rates and their end surfaces becoming immersed in the slag bath at different depths; feeding a gaseous cooling medium onto the exposed surface of the consumable electrode having its end surface closer to the slag/atmosphere interface than the end surfaces of the other electrodes whereby the consumable electrode which is less immersed in relation to the other electrodes is partially cooled by the gaseous cooling medium and descends into the slag bath; and continuing to feed the gaseous cooling medium until the penetration of all of the electrodes into the slag bath becomes equal.

4,120,696

PROCESS FOR THE PRODUCTION OF STEEL

Günther Geck, Hagen, and Jürgen Langhammer, Bremen, Platjenwerbe, both of Germany, assignors to Klöckner-Werke AG, Duisburg, Germany

Continuation of Ser. No. 471,074, May 17, 1974, abandoned. This application Jan. 5, 1977, Ser. No. 756,849
Claims priority, application Fed. Rep. of Germany, May 19, 1973, 2325593
Int. Cl.[2] C21C 5/52
U.S. Cl. 75—13 **6 Claims**

1. A process for the continuous production of steel from a ferrous metal charge, comprising

admitting said ferrous metal charge into a substantially vertically arranged first zone so as to form a column of said charge in said first zone,

said charge continuously descending along said first zone by gravity,

and the leading end of said column being located in said first zone;

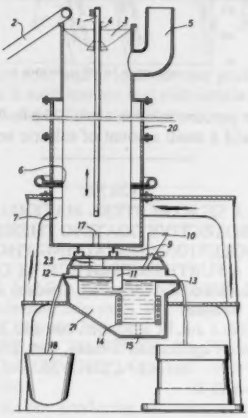
continuously melting said leading end by directing an oxidiz-

ing flame at said column from below said column, thereby burning off impurity components in said charge during the melting thereof,

so as to obtain a mass which includes molten steel and slag;

continuously performing direct transfer of said mass from said first zone into a second zone which is arranged below and communicates with said first zone,

said second zone being at least substantially sealed from



ambient atmosphere so as to prevent oxygen from entering said second zone;

continously separating and removing said slag from said molten metal in said second zone;

superheating said molten metal by electrical means;

and introducing a deoxidizing agent and alloying additions into said superheated molten metal thereby obtaining steel having a desired composition;

and continuously removing said steel from said second zone.

4,120,697

SEGREGATION-SEPARATION OF COPPER FROM NICKEL IN COPPER-NICKEL SULFIDE CONCENTRATES

Lamar D. Coffin, Edison, and William R. Opie, Holmdel, both of N.J., assignors to Amax Inc., Greenwich, Conn.

Filed Apr. 15, 1977, Ser. No. 787,786

Int. Cl.[2] C22B *15/00*

U.S. Cl. 75—72 **12 Claims**

1. The process for separating copper values from at least one nickeliferous sulfidic material selected from the group consisting of ore, ore concentrates, mattes, or other metallurgical intermediates which comprises roasting the sulfidic material to produce a calcine, mixing the calcine with at least one halide salt heat transformable to a halogen or hydrogen halide at a segregation roasting temperature in small but effective amounts to halogenate copper values contained in the calcine and a particulate carbonaceous reductant, heating the mixture to a segregation roasting temperature between about 625° C. and 725° C. whereby copper values contained in the calcine are halogenated, transported to the carbonaceous reductant and precipitated as metallic copper on the carbonaceous reductant, cooling the heated calcine mixture and separately recovering the metallic copper precipitate which has a copper to nickel ratio of at least eight times that of the sulfidic material.

4,120,698

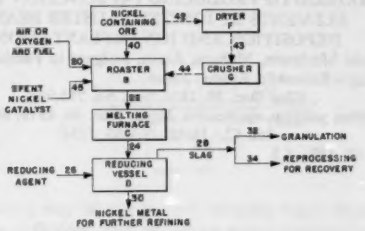
RECOVERY OF NICKEL FROM WASTES

Walter D. Atchison, Hudson; Alan English, Cleveland, both of Ohio, and Donald Halter, Riddle, Oreg., assignors to The Hanna Mining Company, Cleveland, Ohio

Filed Nov. 21, 1977, Ser. No. 853,089

Int. Cl.[2] C22D *7/00*

U.S. Cl. 75—82 **16 Claims**



1. A method for recovering nickel from waste materials containing nickel which comprises the steps of

(a) subjecting a mixture of the waste material and a nickel-containing ore to oxidizing conditions at an elevated temperature,

(b) melting the oxidized mixture,

(c) subjecting the melt to reducing conditions, and

(d) recovering the desired nickel.

4,120,699

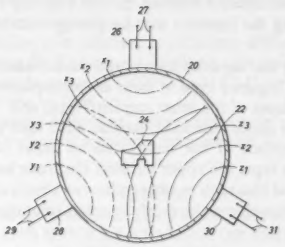
METHOD FOR ACOUSTICAL CLEANING

Alvin B. Kennedy, Jr., P.O. Box 1271, Alvin, Tex. 77511; Lawrence E. Shirey, Alta Loma, Tex.; Harper Eugene Sharp, Houston, Tex.; Lawrence E. Trowbridge, Seabrook, Tex., and Robert L. Magee, Alvin, Tex., assignors to Alvin B. Kennedy, Jr., Alvin, Tex.

Continuation-in-part of Ser. No. 521,762, Nov. 7, 1974, abandoned. This application Mar. 18, 1976, Ser. No. 668,316

Int. Cl.[2] B08B *3/12, 17/02;* F28G *7/00*

U.S. Cl. 134—1 **11 Claims**



1. The method of cleaning the surfaces of a body immersed in a liquid contained in a vessel, comprising the steps of

propagating a plurality of opposing acoustic wave trains through the liquid in said vessel, wherein each wave train includes a series of wave fronts having a frequency and phase relationship, and

limiting the energy level in each wave train to below the cavitation level of the liquid, and

continuously varying the frequency of at least one of said wave trains with respect to the other wave trains for causing constructive interference between said opposing acoustic wave trains to create a series of augmented acoustic waves that are spatially displaced in relation to each other and successive in time interval, each augmented wave having an intensity greater than the cavitation level

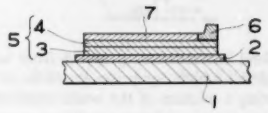
of the liquid for cleaning the surfaces of the body by sweeping over the surfaces.

4,120,700

METHOD OF PRODUCING P-N JUNCTION TYPE ELEMENTS BY IONIZED CLUSTER BEAM DEPOSITION AND ION-IMPLANTATION

Kiyoshi Morimoto, Mobara, Japan, assignor to Futaba Denshi Kogyo Kabushiki Kaisha, Japan

Filed Dec. 28, 1976, Ser. No. 755,066
Claims priority, application Japan, Dec. 30, 1975, 50-156808
Int. Cl.[2] H01L *21/265, 7/54*
U.S. Cl. 148—1.5 **4 Claims**



1. A method of producing a p-n junction type solid-state element comprising the steps of:

providing a substrate;

forming a substrate electrode on at least a part of the upper surface of the substrate;

vaporizing a semiconductor material of one impurity type in a vacuum region to form a vapor of said material;

bombarding the vapor with electrons to ionize at least a part thereof;

accelerating the ionized vapor in an electric field to cause the vapor to impinge on the substrate electrode to form an ion-plated semiconductor layer of the one impurity type on the substrate, the substrate electrode being formed of a metal film such as can produce an ohmic contact with the semiconductor layer of the one impurity type;

ionizing impurity atoms such as can form a semiconductor layer having the type of conductivity opposite to that of the semiconductor layer of the one impurity type;

accelerating the impurity ions by giving them kinetic energies;

implanting the impurity ions in the semiconductor layer of the one impurity type to form an ion-implanted semiconductor layer of the other impurity type; and

forming an upper terminal electrode on at least a part of the upper surface of the semiconductor layer of the other impurity type, the upper terminal electrode being formed of a metal film such as can produce an ohmic contact with the semiconductor layer of the other impurity type.

4,120,701

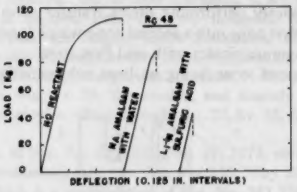
REACTANT FOR STEEL

Clarence H. Walker, Jr., Phoenix, Ariz., and William B. Steward, Jr., Haddon Heights, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 25, 1966, Ser. No. 576,178
Int. Cl.[2] C22F *3/00*; C22C *7/00*
U.S. Cl. 148—4 **6 Claims**

1. A method for diminishing the strength and ductility of steel comprising contacting said steel with a lithium-indium amalgam containing a small amount of sulfuric acid.

5. A reactant for diminishing the strength and ductility of steel consisting essentially of an amalgam containing about 0.75



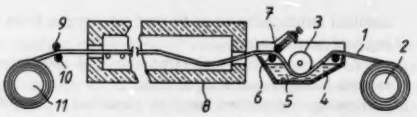
to 1.25 weight percent lithium, about 0.25 to 0.75 weight percent indium, and a small amount of sulfuric acid.

4,120,702

TREATING A SILICON STEEL MATERIAL HAVING A SILICATE PROTECTIVE COATING THEREON WITH AN AQUEOUS SOLUTION CONTAINING PHOSPHATES TO FORM A FURTHER PROTECTIVE COATING

Carl Artur Åkerblom, Surahammar, Sweden, assignor to Asea Aktiebolag, Sweden

Filed Jul. 6, 1977, Ser. No. 813,255
Claims priority, application Sweden, Oct. 29, 1976, 7612028
Int. Cl.[2] C23F *7/10*
U.S. Cl. 148—6.15 R **16 Claims**



1. A process for reinforcing a silicon steel material which has an alkaline earth metal silicate protective layer thereon comprising the steps of coating the alkaline earth metal silicate protective layer with an aqueous solution containing colloidal or suspended silica; 10–200 parts by weight phosphate ions, based on 100 parts by weight of silica calculated as SiO_2 without water; 2–20 parts by weight of ions selected from the group consisting of iron and manganese ions, or both; and an amount of negative ions which deviates from an equivalent amount of hydrogen ions in the solution by a maximum of 40 percent and which are capable of converting to volatile products at temperatures of below 400° C; and then heating the coated silicon steel material to form a further protective phosphate layer over the alkaline earth metal silicate protective layer.

4,120,703

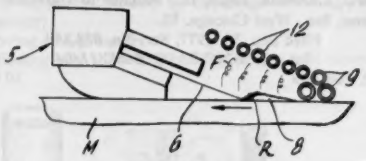
METHOD AND APPARATUS FOR REDUCING SMOKE AND PREVENTING SECONDARY FINS DURING SCARFING

Stephen August Engel, Shenorock, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 608,987, Aug. 29, 1975, abandoned. This application Aug. 26, 1977, Ser. No. 828,204
Int. Cl.[2] B23K *7/06*
U.S. Cl. 148—9.5 **24 Claims**

1. In a thermochemical scarfing process wherein (a) a stream of scarfing oxygen is directed against a reaction zone of molten metal on the surface of the metal workpiece to produce a thermochemical reaction thereon, and (b) relative movement is provided between the oxygen stream and the workpiece to continue the reaction along the metal surface to produce the desired scarfing cut, said reaction forming a molten puddle in front of the advancing reaction zone that tends to grow larger as the cut progresses, the improvement comprising:

(c) directing at least one stream of non-reactive fluid so as to form a fluid sheet-like curtain that provides a cover over



the reaction zone and at least the rear portion of the molten puddle in such manner that said curtain forms a pocket with the surface of the workpiece.

4,120,704

MAGNETIC ALLOY AND PROCESSING THEREFOR

Richard L. Anderson, Marengo, Ill., assignor to The Arnold Engineering Company, Marengo, Ill.

Filed Apr. 21, 1977, Ser. No. 789,747
Int. Cl.² C21D *1/04*; C22C *38/30*
U.S. Cl. 148—103 **24 Claims**

1. In a process for producing an iron-base magnetic alloy having, by weight, from 3 to 19% cobalt, at least 10% chromium, from 10 to 40% of at least one element from the group consisting of chromium, vanadium, titanium, columbium, aluminum, silicon, molybdenum, tungsten and zirconium, up to 0.1% carbon, up to 0.1% nitrogen and up to 1.0% of elements from the group consisting of magnesium and calcium; which process includes the steps of: preparing a melt of said alloy, casting said alloy, hot working said alloy, and heat treating said alloy so as to develop its magnetic properties; the improvement comprising the steps of: incorporating in said melt more than 0.01% of at least one rare earth element from the group consisting of yttrium, lanthanum and the elements from the lanthanide series, and refining said metal so as to remove undesirable products resulting from reaction between said rare earth addition and undesirable impurities, said rare earth addition and refining improving the hot ductility of said metal; said heat treated magnetic alloy having no more than 0.5% of said rare earth addition and no more than 1.0% manganese.

4,120,705

VACUUM DEPOSITION PROCESS FOR FABRICATING A CDS—CU_2S HETEROJUNCTION SOLAR CELL DEVICE

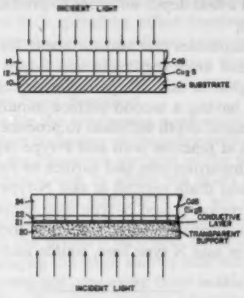
Fred A. Shirland, Franklin Township, Westmorland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 563,420, Mar. 28, 1975, abandoned. This application Feb. 11, 1976, Ser. No. 657,136
Int. Cl.² H01L *21/363, 31/04*
U.S. Cl. 148—174 **2 Claims**

1. A method for making an epitaxial heterojunction device comprising the steps of:

(a) heating a substrate having an electrically conductive surface in a vacuum chamber to a temperature range of about 200° C to about 435° C;

(b) vapor depositing a crystalline layer of Cu_2S on said conductive surface from starting material maintaining close to a stoichiometric ratio of two copper atoms to one sulfur atom while maintaining said temperature range; and



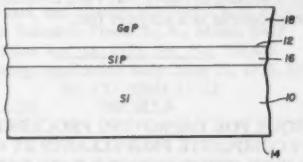
(c) halting step (b) and abruptly initiating vapor deposition of a crystalline layer of Cds on said crystalline layer of Cu_2S while maintaining said temperature range.

4,120,706

HETEROEPITAXIAL DEPOSITION OF GAP ON SILICON SUBSTRATES

Donald R. Mason, Indialantic, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Sep. 16, 1977, Ser. No. 833,935
Int. Cl.² H01L *21/205, 21/302, 29/26*
U.S. Cl. 148—175 **17 Claims**



1. A method of forming a gallium phosphide layer on a silicon substrate comprising:

(a) prebaking said substrate in palladium diffused hydrogen;

(b) treating (111) plane of said silicon substrate with a phosphide in the range of 1100° C. to 1140° C. to form a silicon phosphide surface; and

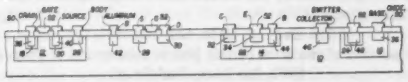
(c) epitaxially depositing gallium phosphide on said silicon phosphide surface at a reduced temperature.

4,120,707

PROCESS OF FABRICATING JUNCTION ISOLATED IGFET AND BIPOLAR TRANSISTOR INTEGRATED CIRCUIT BY DIFFUSION

James D. Beasom, Melbourne, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Mar. 30, 1977, Ser. No. 782,694
Int. Cl.² H01L *27/02, 21/225, 21/20, 29/72*
U.S. Cl. 148—186 **14 Claims**



1. A process for fabricating junction isolated, integrated circuits including bipolar and insulated gate field effect transistors in a surface of an N-type substrate without forming junction isolation regions comprising the steps of:

diffusing impurities into said surface to form spaced P-type body region and collector region in said substrate, said P-type regions having a first surface impurity concentration and a first depth sufficient to produce a low impurity gradient;

diffusing impurities into said surface to form spaced N-type source and drain regions in said P-type body region and base region in said P-type collector region, said N-type regions having a second surface impurity concentration and a second depth sufficient to produce a lower impurity gradient at junction with said P-type regions;

diffusing impurities into said surface to form spaced P-type source and drain regions in said N-type substrate and an emitter region in said N-type base region; and

diffusing impurities into said surface to form N-type contact regions in said N-type base, source and drain regions.

4,120,708

NONMETALLIZED SOLID FLUORINE OXIDIZER GAS GENERATOR

Joseph E. Flanagan, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 732,243, Oct. 14, 1976, abandoned. This application Feb. 13, 1978, Ser. No. 877,446

Int. Cl.[2] C06B *45/08*

U.S. Cl. 149—17 **1 Claim**

1. A solid propellant composition for chemical laser applications comprising:

the fluorine oxidizing salt NF_4PF_6;

a material serving simultaneously as an augmenting fuel and sequestering agent, said material being selected from the group consisting of NaN_3, Na_3N and mixtures thereof; and

polyphosphonitrile as a polymer fuel.

4,120,709

TECHNIQUE FOR IMPROVING PROCESSIBILITY OF CERTAIN COMPOSITE PROPELLANTS BY CALCINING THE IRON OXIDE BURNING RATE CATALYST

James W. Hamner; James O. Hightower, both of Huntsville, and Carl M. Rector, New Market, all of Ala., assignors to Thiokol Corporation, Newtown, Pa.

Filed Apr. 25, 1973, Ser. No. 354,293

Int. Cl.[2] C06B *45/10*

U.S. Cl. 149—19.92 **3 Claims**

1. A method of lengthening the processing pot life of a hydroxy terminated isocyanate cured polymer propellant containing ammonium perchlorate, aluminum powder and iron oxide which comprises the use of iron oxide which has been calcined at a temperature in the range of from 225° C. to 850° C. inclusive prior to admixture into the propellant.

4,120,710

NITROALIPHATIC DIFLUOROFORMALS

Howard M. Peters, Palo Alto, and Robert L. Simon, Jr., San Carlos, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 16, 1975, Ser. No. 641,320

The portion of the term of this patent subsequent to Nov. 25, 1992, has been disclaimed.

Int. Cl.[2] C06B *25/00*; C07C *43/04*

U.S. Cl. 149—88 **6 Claims**

1. A nitroaliphatic difluoroformal of the formula $RCH_2OCF_2OCH_2R'$ wherein R = $FC(NO_2)_2$— and R′ = $F_2C(NO_2)$— or CF_3—; or R = R′ $CF_3OCH_2C(NO_2)_2$—.

4,120,711

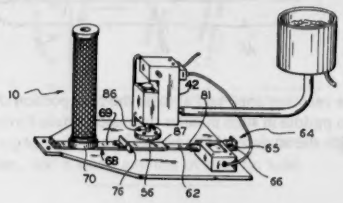
PROCESS FOR SEALING END CAPS TO FILTER CARTRIDGES

William J. Gudeman, Elgin, Ill., assignor to Universal Water Systems, Inc., West Chicago, Ill.

Filed Sep. 30, 1977, Ser. No. 838,140

Int. Cl.[2] B29C *27/00*; B65C *11/04*

U.S. Cl. 156—69 **10 Claims**



1. A method for adhesively sealing annular, cup-shaped end caps to a cylindrical cartridge of filter material comprising the steps of:

providing an annular end cap receiving means, said end cap receiving means being generally cup-shaped in cross-section and being adapted for receiving an end cap, the inner surface of said receiving means being presented upwardly and said receiving means being slidably mounted on an elongate track for movement between first and second positions;

providing means for dispensing a preselected quantity of a liquid adhesive into said receiving means when said receiving means is in said first position in response to a signal;

providing means for generating said signal when said receiving means is moved to said first position;

placing an end cap in said receiving means so that the inner surface thereof is presented upwardly, moving said receiving means to its first position and dispensing said quantity of molten adhesive therein while said receiver is stationary;

moving said receiving means to its second position;

inserting one end of said cylindrical cartridge into said adhesive containing end cap under sufficient pressure to spread said adhesive over the end thereof while said adhesive is still in a molten condition; and

hardening said adhesive to seal end cap to said cartridge.

4,120,712

METHOD OF SECURING TWO NON-METAL SURFACES TOGETHER USING A HOT MELT TYPE FASTENER HEATABLE BY INDUCTION HEATING

Melvin R. Sindt, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 559,341, Mar. 17, 1975, Pat. No. 3,996,402, which is a continuation-in-part of Ser. No. 448,110, Mar. 4, 1974, abandoned, which is a division of Ser. No. 331,724, Feb. 12, 1973, Pat. No. 3,845,268. This application Dec. 11, 1975, Ser. No. 639,678

Int. Cl.[2] B29C *27/00*; E04F *13/00*

U.S. Cl. 156—71 **1 Claim**

1. The method of securing a sheet of nonmetallic panelling to a nonmetallic support structure which comprises:

selecting a hot melt type fastener having a pressure contact sensitive outer surface portion, a pair of sheets of heat activatable material and an inner eddy current conducting sheet, said eddy current conducting sheet disposed between said pair of sheets of heat activatable material, said pressure contact sensitive outer surface portion comprising a coating disposed on a first of said pair of sheets;

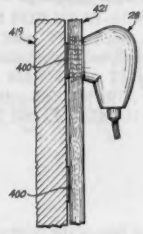
positioning said fastener with the pressure contact sensitive

outer surface portion thereof against said support structure;

applying pressure between said outer surface portion and said support structure by applying forces against said fastener;

removing said pressure;

positioning said sheet of panelling against said nonmetallic



support structure in overlying relationship with respect to said fastener;

positioning an induction heater apparatus against said sheet of panelling and in overlying relationship with respect to said fastener; then

energizing said induction heater to transmit electrical energy and induce eddy currents in said eddy current conducting sheet for a predetermined time period.

4,120,713

PROCESS AND APPARATUS FOR THE CONTINUOUS PRODUCTION OF A FIBROUS WEB-LIKE PILE PRODUCT

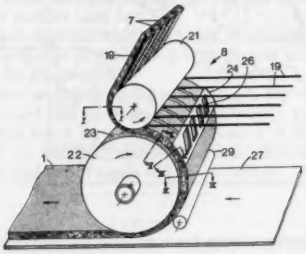
Finn Ulrik Hansen Jensen, Skanderborg; Per Drengsgaard Nielsen, Braedstrup, and Esben Bruhn, Hov, all of Denmark, assignors to A/S Weston Taeppefabrik, Denmark

Filed Jun. 14, 1977, Ser. No. 806,371

Claims priority, application Denmark, Jun. 21, 1976, 2781/76

Int. Cl.[2] B32B *31/18*

U.S. Cl. 156—72 **9 Claims**



1. A process for the continuous production of a fibrous web-like pile product consisting of fibers oriented substantially at right angles to the two main surfaces of the web, starting from a primary fibrous web in which the fibers are oriented substantially along the main surfaces of the web either transversely or longitudinally of the web, comprising the steps of cutting the primary web into strips consisting of cut-off fibers, arranging the strips side by side with the cut-off fibers standing on end and conveying them in this side-by-side relationship to a first depositing position, depositing the strips in the first depositing position onto a moving intermediary supporting arcuate surface having perforations, sucking air through said perforations by creating a vacuum on the side of said intermediary supporting surface facing away from the strips, thereby creating on the strips an attractive force sufficient to hold them attached thereto while being inverted by the supporting surface, at the same time guiding the afflux of air to the intermediary supporting surface through the web formed by the strips at least over part of the travel of the latter on the intermediary supporting surface in such a manner as to subject the fibers forming the strips to a spreading effect transversely of the strips, and thereafter depositing the fibers in inverted position at a second depositing position onto a moving product receiving surface while at the same time interrupting the suction acting on the fibers being deposited.

4. An apparatus for the continuous production of a fibrous web-like pile product consisting of fibers oriented substantially at right angles to the two main surfaces of the web, starting from a primary fibrous web in which the fibers are oriented substantially along the main surfaces of the web either transversely or longitudinally of the web, said apparatus comprising means for cutting the primary web into strips consisting of cut-off fibers, arranging the strips side by side with the cut-off fibers standing on end and conveying them in this side-by-side relationship to a first depositing position, characterized in that it comprises a movable element constituting a perforated intermediate supporting arcuate surface arranged to receive said strips in said first depositing position and to convey them to a second depositing position for deposition in inverted position on a moving product receiving surface, means active between said first and second depositing positions for producing an attractive force acting on the strips in a direction towards said intermediate supporting surface to retain the strips thereon and for subjecting the fibers of the strips to a spreading action directed towards the spaces between the strips while said strips are being inverted by said supporting surface.

4,120,714

APPARATUS FOR SETTING BEAD RINGS ON THE CARCASS OF A VEHICLE TIRE

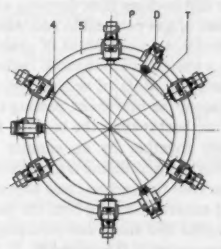
Bruno Colombani, and Antonio Pacciarini, both of Milan, Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Filed Apr. 21, 1977, Ser. No. 789,638

Claims priority, application Italy, May 12, 1976, 23171 A/76

Int. Cl.[2] B29H *17/12*

U.S. Cl. 156—131 **16 Claims**



1. A method for assembling reinforcement rings of the casing beads of a tire wherein casing fabrics are wound around a cylindrical drum of the expandable type, the rings are centered in a plane normal to the axis of said drum in a position coaxial to the latter, the ring is locked axially on both sides thereof in the centered position by means of a pliers-style grasping device which is axially shiftable, the rings are fitted onto said drum by axially shifting said device into a pre-set position along the longitudinal development of the drum which position is fixed with respect to the adjacent extremity of said drum, and which leaves both extremities of said casing fabrics axially protruding towards the exterior with respect to the whole complex of said rings, the said casing fabrics are expanded by expansion of said drum and are pressed against the radially internal surface of said rings, said locking device is thereafter removed, characterized in that it comprises at least the following steps:

(1) said rings are centered by means of radial thrusts directed

towards the exterior and brought to bear on at least three distinct points on the radially internal surface of said ring;

(2) carrying out on said ring, after said centering but before said locking thereof the further step, preliminary to said fitting of said ring onto said drum, of reviving the adhesiveness of said ring, at least on most of its radially internal surface;

(3) said locking device accompanying the drum surface under expansion at one side of said ring and said locking device being removed only when said casing fabric has radially surpassed the ring on both sides.

4,120,715

METHOD OF MANUFACTURING A FILTER FOR USE IN VENTING COLOSTOMY OR ILEOSTOMY APPLIANCES

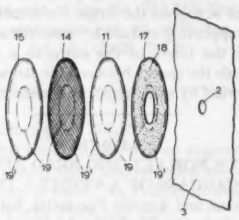
Malcolm Charles Ockwell; Patrick Hugh McLeod, and Peter James Briggs, all of London, England, assignors to Matburn (Holdings) Limited, London, England

Filed Jun. 30, 1977, Ser. No. 811,532

Claims priority, application United Kingdom, Jul. 6, 1976, 27974/76

Int. Cl.[2] A61F *5/44;* B32B *31/18, 31/20*

U.S. Cl. 156—252 **4 Claims**



2. A method of making a filter for use in venting a colostomy or ileostomy bag, the process comprising passing a sheet of release paper and a backing film adhered thereto by a layer of adhesive through a punching station; punching a hole through the release paper and backing film; forming an assembly comprising a first sheet of gas-permeable and water-impermeable, spun-bonded material, a second sheet of gas-permeable, spun-bonded material, a sheet of carbon cloth between the first and second sheets, and the sheet of release paper, and adhered backing film, adjacent the first sheet; passing the assembly to a heat-sealing station; heat sealing the backing film and the first and second sheets together by an annular weld extending through the carbon cloth to define a filter comprising the first and second sheets with the carbon cloth therebetween and the release paper and adhered backing film, the backing film being directly welded to the first sheet; and punching out the welded filter from the remainder of the assembly.

4,120,716

METHOD OF APPLYING PRINTED LABELS TO FLEXIBLE ENVELOPES USING CORONA DISCHARGE TREATMENT

Robert André Bonet, Epernon, France, assignor to W. R. Grace & Co., Duncan, S.C.

Filed Jun. 3, 1977, Ser. No. 802,997

Claims priority, application United Kingdom, Jun. 3, 1976, 23042/76

Int. Cl.[2] B29C *19/02;* B32B *31/00*

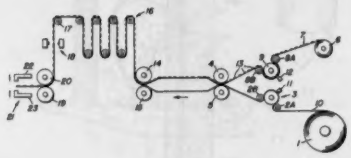
U.S. Cl. 156—272 **6 Claims**

1. A method of applying printed labels to flexible envelopes comprising

(a) providing a first flattened tubular thermoplastic film material and sealing it transversely at periodic intervals and then severing the sealed tubing at periodic intervals so as to construct a flexible envelope having a sealed bottom and open top,

(b) forming printed labels by printing a series of repetitive indicia on a second sheet of thermoplastic film the width of each of said indicia being less than the width of one side of said flattened tubing,

(c) subjecting a face of the printed labels and at least a portion of the first film material having the same dimensions as said labels to a corona discharge treatment, and



(d) bringing the treated face of the printed labels into contact with the treated part of the said first film material to bond the printed labels to the said first film material either before, during or after formation of the flexible envelope, and wherein

the step of bringing into contact is carried out without generalized application of heat.

4,120,717

LOADING DEVICE FOR A TIRE ASSEMBLY DRUM

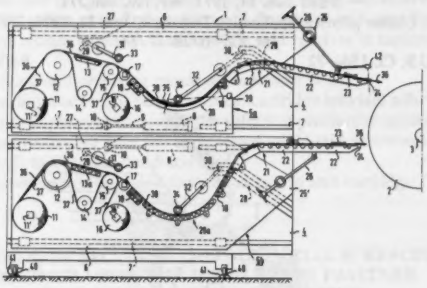
Harry Rost, Munich, Germany, assignor to Metzeler Kautschuk AG, Munich, Germany

Filed May 26, 1977, Ser. No. 800,913

Claims priority, application Fed. Rep. of Germany, May 26, 1978, 2623638

Int, Cl.[2] B29H *17/20*

U.S. Cl. 156—405 R **17 Claims**



1. A loading device for supplying cord strips, intended for the belt or body of a tire, to a tire assembly drum, the loading device being comprised of at least one guide unit, said at least one guide unit comprising:

a storage roll, said storage roll being adapted to store said cord strip and a backing strip;

a deflecting means receiving said cord strip and backing strip from said storage roll;

initial separating means for separating said cord strip from said backing strip;

a take-up roller means temporarily reuniting said cord strip and said backing strip;

final separating means for separating said cord strip from said backing strip and for storing said removed backing strip;

compensating loop means for forming said cord strip into a short loop, said compensating loop means comprising a curved cage means including sliding guide surfaces;

feed means for feeding said cord strip onto said tire assembly drum, said compensating loop means being rigidly positioned between said final separating means and said feed means;

drive means for driving each said respective means; and

extensible positioning guides for longitudinally positioning said guide unit relative to said tire assembly drum.

4,120,718

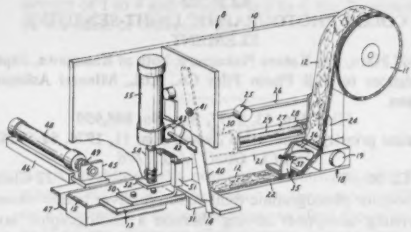
APPLICATOR FOR HEAT-ACTIVATABLE TAPE

Mark G. Hudalla, Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 615,774, Sep. 22, 1975, Pat. No. 4,019,948. This application Feb. 18, 1977, Ser. No. 770,182

Int. Cl.² B32B *31/00*

U.S. Cl. 156—499 **1 Claim**



1. A tape applicator for applying a length of material coated with a heat-activatable adhesive to a receptor surface, said applicator comprising

movable support pad means for supporting a length of said material,

means for moving said pad means from a first receiving position to a second applying position to apply said length of material to the receptor surface,

heater block means for making wiping contact with the adhesive-coated surface of said length of material supported on said pad means for activating said adhesive before the length of material is placed into contact with said receptor surface, said heater block means comprising a bar of metal having a longitudinal axis and having a bore disposed parallel with said axis,

a heating unit disposed within said bore which is thermostatically controlled to maintain a high surface temperature on said bar of metal, and

spring means supporting said bar of metal for urging the same toward said pad means during wiping contact between said block means and the adhesive of a length of material on said pad means to afford intimate contact between said bar of metal and said adhesive.

4,120,719

CEMENTED CARBONITRIDE ALLOYS CONTAINING TANTALUM

Toshio Nomura; Tsuyoshi Asai; Takaharu Yamamoto, and Akio Hara, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Japan

Filed Dec. 6, 1976, Ser. No. 747,689

Int. Cl.² B22F *3/00*; C22C *29/00*

U.S. Cl. 75—238 **5 Claims**

1. A cemented carbonitride alloy comprising refractory metallic components and non-metallic components for forming mainly a hard phase with an iron group metal for binding the hard phase, in which the refractory metallic components are titanium, tantalum, tungsten and molybdenum, the non-metallic components are nitrogen and carbon, the proportion of nitrogen being 5 to 40% by weight of the non-metallic components, the total amount of the non-metallic components being 0.8 to 1.0 times as much as that of the refractory metallic components by atomic ratio and the hard phase consisting of a carbonitride free from a phase consisting of tungsten carbide only and which alloy contains 3 to 25% by weight of the binder metal, at least 20% by weight of titanium, 5 to 40% by weight of tungsten and molybdenum, the ratio by weight of the sum of tungsten carbide and molybdenum carbide to all the carbides added as raw materials being less than 0.5, and 3 to 40% by weight of tantalum.

4,120,720

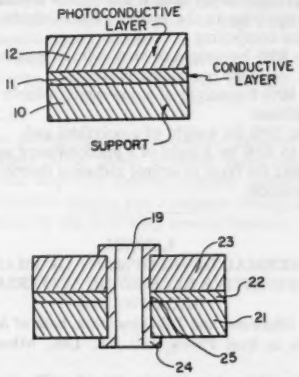
COMBINED MEANS FOR ACCURATELY POSITIONING ELECTROSTATOGRAPHIC RECORDING MEMBERS DURING IMAGING AND MEANS FOR ESTABLISHING ELECTRICAL CONNECTION WITH THE INTERMEDIATE CONDUCTIVE LAYER THEREOF

Frank C. Gross, Wilbraham, Mass., assignor to Scott Paper Company, Philadelpia, Pa.

Filed Jan. 18, 1974, Ser. No. 434,399

Int. Cl.² G03G *5/04*; C23B *5/50*; B41M *3/08*; H02G *3/04*

U.S. Cl. 96—1.5 N **10 Claims**



1. In an electrostatographic recording member comprising at least:

(1) an electrically-insulating substrate;

(2) an electrically-conductive intermediate layer overlying a first surface of said substrate; and

(3) an electrically-insulating outer layer overlying said conductive layer, said outer layer containing a photoconductive material or being composed of a dielectric material of high volume resistivity;

the improvement comprising a combined means for accurately positioning said recording member during imaging thereof and for establishing an electrical ground connections to said intermediate conductive layer, said combined means comprising at least two separate holes through said recording member in a non-image area thereof and a conductive lacquer coating on the inner surface of at least one of said holes, said holes being adapted to receive protrusions during imaging to accurately position said recording member and said conductive lacquer being in electrical contact with the exposed intermediate conductive layer on the inner surface of said hole.

4,120,721

RADIATION CURABLE COMPOSITIONS FOR COATING AND IMAGING PROCESSES AND METHOD OF USE

Arthur Donald Ketley, Columbia, Md.; Paul Richard Hein, and Michael Wen-Chien Yang, both of Marietta, Ga., assignors to W. R. Grace & Co., New York, N.Y.

Filed Jun. 2, 1977, Ser. No. 802,706
Int. Cl.[2] B05D *3/06*
U.S. Cl. 96—36.3 **8 Claims**

1. A liquid radiation curable composition comprising
(1) 10 to 80% by weight of an acrylic or methacrylic terminated, urethane containing polyene,
(2) 5 to 60% by weight of a non-water soluble vinyl monomer diluent,
(3) 0.1 to 35% by weight of a polythiol and
(4) 0.01 to 10% by weight of a photoinitiator,
which forms a solid cured polythioether on exposure to actinic or high energy ionizing radiation.

4. The process of forming a printing plate which comprises exposing to actinic radiation projected through an image-bearing transparency selected portions of a radiation curable composition comprising
(1) 10 to 80% by weight of an acrylic or methacrylic terminated, urethane containing polyene,
(2) 5 to 60% by weight of a non-water soluble vinyl monomer diluent,
(3) 0.1 to 35% by weight of a polythiol and
(4) 0.01 to 10% by weight of a photoinitiator for a time sufficient to insolubilize the radiation curable composition in the exposed portions and thereafter removing the unexposed radiation curable composition.

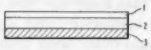
7. The process of forming a coating on a substrate which comprises applying to the surface of a substrate a layer of a composition comprising
(1) 10 to 80% by weight of an acrylic or methacrylic terminated, urethane containing polyene,
(2) 5 to 60% by weight of a non-water soluble vinyl monomer diluent,
(3) 0.1 to 35% by weight of a polythiol and
(4) 0.01 to 10% by weight of a photoinitiator and thereafter exposing the layer to actinic radiation thereby curing said composition.

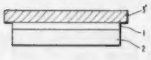
4,120,722

THERMAL DEVELOPMENT OF IMAGED LIGHT-SENSITIVE RECORDING MATERIAL USING MICROWAVES

Yoshihiko Okamoto, and Takahiro Ohta, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 596,124, Jul. 15, 1975, abandoned. This application Apr. 18, 1977, Ser. No. 788,385
Claims priority, application Japan, Jul. 15, 1974, 49-81361
Int. Cl.[2] G03C *5/34, 5/24*
U.S. Cl. 96—49 **5 Claims**





1. A process for thermal development which comprises irradiating with microwaves an imagewise light exposed thermally developable light-sensitive recording material comprising a support having a conductive material dispersed therein and a thermally developable light-sensitive recording layer on the support and in thermal contact therewith, said support having a surface electric resistence ranging from about 1 ohm/□ to about 10^5 ohm/□, whereby the heat generated in said support develops said thermally developable recording material.

4,120,723

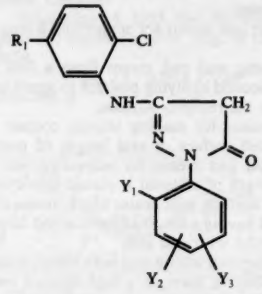
COLOR PHOTOGRAPHIC LIGHT-SENSITIVE ELEMENT

Hiroshi Hara, and Kotaro Nakamura, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

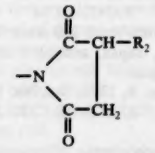
Filed Jun. 13, 1977, Ser. No. 805,959
Claims priority, application Japan, Jun. 11, 1976, 51-69147
Int. Cl.[2] G03C *1/40, 1/76*
U.S. Cl. 96—74 **22 Claims**

1. A color photographic light-sensitive silver halide element comprising a support having thereon a photographic layer containing (a) at least one magenta coupler represented by the general formula (II):

(II)

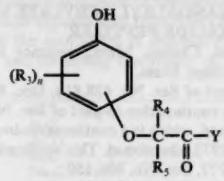


wherein Y_1 represents a halogen atom, an alkyl group having 1 to 5 carbon atoms or an alkoxy group having 1 to 5 carbon atoms; Y_2 and Y_3, which may be the same or different, each represents a hydrogen atom, a halogen atom, an alkyl group having 1 to 5 carbon atoms or an alkoxy group having 1 to 5 carbon atoms; R_1 represents R_2CONH—, R_2OOC—, R_2NHSO_2— or



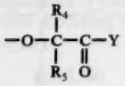
wherein R_2 represents a hydrogen atom, a straight chain or branched chain alkyl group, having 1 to 35 carbon atoms, an alkenyl group having 2 to 22 carbon atoms, a cycloalkyl group having 5 to 22 carbon atoms, an aralkyl group having 7 to 22 carbon atoms or a cycloalkenyl group having 5 to 22 carbon atoms, and

(b) at least one color image stabilizer represented by the general formula (III):



(III)

wherein R_3 represents a hydrogen atom, an alkyl group having 1 to 35 carbon atoms, an alkenyl group having 1 to 22 carbon atoms, a cycloalkyl group having 5 to 22 carbon atoms, an aralkyl group having 7 to 22 carbon atoms, a cycloalkenyl group having 5 to 22 carbon atoms and an aryl group having 6 to 35 carbon atoms; *n* represents an integer of 1 to 4 and where *n* is 2 to 4, the R_3 groups may be the same or different; the



group is substituted at a position unsubstituted with R_3 and wherein R_4 and R_5, which may be the same or different, each represents a hydrogen atom, an alkyl group having 1 to 35 carbon atoms, an alkenyl group, a cycloalkyl group, an aralkyl group or a cycloalkenyl group; and Y represents a hydrogen atom, an alkyl group having 1 to 35 carbon atoms, an alkenyl group, an aralkyl group, a cycloalkyl group, a cycloalkenyl group, an aryl group having 6 to 35 carbon atoms, an alkoxy group, an aryloxy group, an alkylthio group, an arylthio group, an arylamino group, an alkylamino group, a cyclic amino group, a heterocyclic amino group or a hydroxy group.

8. The color photographic light-sensitive element as claimed in claim **1**, wherein said photographic layer is a green-sensitive silver halide emulsion layer.

10. The color photographic light-sensitive element as claimed in claim **8**, further including a blue-sensitive silver halide emulsion layer and a red-sensitive silver halide emulsion layer on said support.

4,120,724

SUBBING MATERIAL FOR STYRENE BASES USED IN PHOTOGRAPHIC ELEMENTS

Sumitaka Tatsuta; Nobuo Yamamoto, and Nobuo Tsuji, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

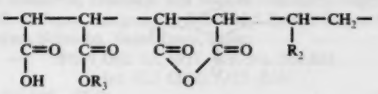
Continuation of Ser. No. 561,505, Mar. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 402,692, Oct. 2, 1973, abandoned. This application Feb. 18, 1977, Ser. No. 770,147

Claims priority, application Japan, Oct. 2, 1972, 47-98821

Int. Cl.[2] **G03C** *1/78*

U.S. Cl. 96—87 A **20 Claims**

1. A method for manufacturing a photographic material which comprises coating a subbing composition in layer form on a styrene-based polymer support, said composition consisting essentially of 5g or less per m^2 of said support of a complete or partial reaction product of: materials consisting essentially of (a) a copolymer of styrene or vinyl acetate with maleic anhydride which contains 40–50% by weight of maleic anhydride with (b) water or a hydroxy compound represented by the general formula R_1—OH wherein R_1 is a monovalent hydrocarbon group having 1 to 12 carbon atoms or monovalent organic group having 2–12 carbon atoms and consisting of at least two hydrocarbon fragments and at least one ether linkage between said hydrocarbon fragments, at least 30% of the maleic anhydride units of said copolymer being reacted with the water or the hydroxy compound thereby obtaining a reaction product consisting essentially of the following recurring units:



in which R_3 is a hydrogen atom or a group defined by R_1, R_2 is a phenyl group or a —$OCOCH_3$ group and the amount of the maleic anhydride unit in said copolymer may be zero, and coating a hydrophilic photographic composition containing a hydrophilic resin binder in layer form on the subbing layer, where the resulting hydrophilic photographic composition layer is selected from the group consisting of (1) a layer containing silver halide, (2) a layer containing physical developing nuclei to serve as a receiving layer in diffusion transfer photography, a hydrophilic photographic curl preventing backing layer or a hydrophilic photographic anti-halation backing layer, where a compound containing at least two epoxy groups per molecule is contained in a proportion of from 10 to 500% by weight based on the weight of said copolymer in at least one of the subbing composition or the hydrophilic photographic composition.

4,120,725

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Kiyoshi Nakazyo; Shinji Sakaguchi, and Nobuo Tsuji, all of Minami Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

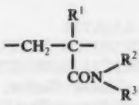
Filed Feb. 24, 1977, Ser. No. 771,704

Claims priority, application Japan, Feb. 24, 1976, 51-19214

Int. Cl.[2] **G03C** *1/10, 1/40*

U.S. Cl. 96—97 **9 Claims**

1. A color photographic light-sensitive material having at least one gelatin silver halide emulsion layer containing an organic solvent dispersed therein, wherein said solvent contains a hydrophobic coupler and a polymer having a recurring unit represented by the following general formula (I):



(I)

wherein R^1 represents a hydrogen atom or a lower alkyl group, and R^2 and R^3, which may be the same or different, each represents a hydrogen atom, an aliphatic hydrocarbon group, an aromatic hydrocarbon group, an alkyl-substituted amino group or an aryl-substituted amino group, with the proviso that both of R^2 and R^3 are not simultaneously hydrogen atoms, the total number of carbon atoms of R^2 and R^3 is 4 or more, R^2 and R^3 do not contain an acidic group and R^2 and R^3 can combine together to form a ring;

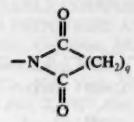
wherein a gelatin continuous phase in said gelatin silver halide emulsion layer contains a polymer having a recurring unit represented by the following general formula (II):

(II)

wherein R^4 has the same meaning as defined for R^1; and Q represents:

(1) —$(CH_2)_pOH$

wherein *p* represents 0 or 1,

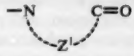


(2)

wherein q represents an integer of 2 to 4,

(3)

wherein R^5 represents an alkyl group; and R^6 represents a hydrogen atom or an alkyl group,



(4)

wherein Z^1 represents the atoms necessary to form a lactam ring, an oxazolidone ring or a pyridone ring, or

(5)

wherein Z^2 represents the atoms necessary to form a morpholine ring.

4,120,726

SILVER-HALIDE EMULSION SENSITIZED WITH AN ASYMMETRICAL DISULFIDE

Gerhard Hanisch, Dessau; Günther Fischer, Leipzig; Seigfried Gahler, Wolfen; Udo Franz, Dessau; Karl Küschel, Mühlbeck; Roland Mayer, Dresden; Günther Bach, and Karl-Wilhelm Jünge, both of Dessau, all of German Democratic Rep., assignors to VEB Filmfabrik Wolfen, German Democratic Rep.

Continuation of Ser. No. 676,592, Apr. 13, 1976, abandoned. This application Aug. 12, 1977, Ser. No. 824,188

Claims priority, application German Democratic Rep., Apr. 15, 1975, 0318542

Int. Cl.[2] G03C *1/28*

U.S. Cl. 96—107 **20 Claims**

1. A photographic emulsion comprising a silver-halide and a sensitizing amount of an asymmetrical disulfide of the formula

$$(W)_a(X)_b\text{A-S-S-B}(Y)_c(Z)_d$$

wherein A and B are independently a benzyl radical or an alkyl radical containing 1 to 4 carbon atoms; X and Y are independently a carboxyl or a C_1 alkoxycarbonyl group; W and Z are independently amino groups which can be alkylated or acylated with a radical having 1 to 2 carbon atoms; wherein the Y and Z groups are attached to the same or different carbon atoms of the B radical, and the W and X groups are attached to the same or different carbon atoms of the A radical and a, b, c, d are each independently integers from 0 to 1; and the sums of $a + d$ is 1 or 2 and $b + c$ is 1.

4,120,727

POLYMERIC CYANOALKYL ACRYLATE SILVER HALIDE PEPTIZER

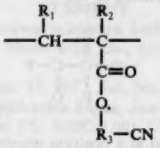
Maurice J. Fitzgerald, Canton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 638,818, Dec. 8, 1975, abandoned, which is a continuation-in-part of Ser. No. 531,801, Dec. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 339,824, Mar. 9, 1973, abandoned. This application Jun. 13, 1977, Ser. No. 806,150

Int. Cl.[2] G03C *1/72*

U.S. Cl. 96—114 **7 Claims**

1. A photosensitive silver halide emulsion wherein the silver halide grains have adsorbed on their surface a substantially continuous layer of an emulsion peptizer consisting essentially of a water soluble film-forming polymeric silver halide grain-growing protective colloid having in its structure at least about 0.5 mole percent repeating units of the formula:



wherein R_1 is hydrogen, a lower alkyl group or a halogen; R_2 is hydrogen, a lower alkyl group, halogen or cyano group; and R_3 is a 1 to 6 carbon alkylene group or a 3 to 6 carbon cycloalkylene group.

4,120,728

THERMALLY DEVELOPABLE LIGHT-SENSITIVE MATERIAL

Shinpei Ikenoue, and Takao Masuda, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 491,010, Jul. 23, 1974, abandoned. This application Apr. 26, 1976, Ser. No. 680,417

Claims priority, application Japan, Jul. 23, 1973, 48-82852

Int. Cl.[2] G03C *1/02, 1/38*

U.S. Cl. 96—114.1 **54 Claims**

1. A thermally developable light-sensitive material comprising a support having thereon at least one layer containing (a) an organic silver salt, (b) a catalytic amount of a light-sensitive silver halide, (c) a reducing agent and (d) a binder, wherein the improvement comprises utilizing as said light-sensitive silver halide, a silver halide which was prepared in the absence of a protective colloid by mixing a solution of a compound capable of releasing a halide ion and a solution of a compound capable of releasing silver ion in the presence of a surface active agent, said silver halide also having been dispersed in a medium of an emulsion of a slightly water-soluble solvent in water present during the preparation of said light-sensitive silver halide.

4,120,729

NOVEL LOW TEMPERATURE MATURING DENTAL GLAZE

Milagros B. Smyth, East Brunswick Township, Middlesex County, and James Lee-You, East Windsor Township, Mercer County, both f, N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Oct. 27, 1977, Ser. No. 846,050

Int. Cl.[2] A61C *13/02;* C03C *5/00;* C09K *3/00*

U.S. Cl. 106—35 **4 Claims**

1. A translucent dental glaze composition suitable for application to a dental porcelain coated metal substrate, said glaze having (a) an average particle size of 10 ± 4 microns and not more than 1% of the particles having a diameter greater than 30 microns, (b) a maturing temperature of from 1400° to 1600° F. and at least about 200° F. lower than the vitrifying tempera-

ture of the dental porcelain of the substrate, and (c) a coefficient of thermal expansion of from 9 to 12 $\times 10^{-6}$/° C. which is lower than the coefficient of thermal expansion of the dental porcelain, and consisting essentially of, on a weight basis:

SiO_2	45–52%
B_2O_3	15–20%
Al_2O_3	10–15%
K_2O	3.5–7.5%
Na_2O	12–17%
CaO	0–1%
ZnO	0–1%
F	1–3%

4. In a method for glazing an artificial tooth comprising a dental porcelain coated metal substrate which has been previously fired and ground comprising the steps of coating said tooth with a dispersion of a glaze in a liquid vehicle, drying said tooth to remove said liquid, and firing said dried tooth, the improvement whereby the tooth is fired to a glossy, slightly textured finish at a temperature of from 1400° to 1600° F. and the glaze is a composition according to claim 1.

4,120,730
BIOCOMPATIBLE CERAMIC GLASS

Felix Trojer, Grand Lancy, Switzerland; Grahame Paul O'Connor, West-Wickham, England, and Helmut Tannenberger, Geneva, Switzerland, assignors to Battelle Memorial Institute, Carouge, Geneva, Switzerland

Filed Feb. 18, 1976, Ser. No. 659,019

Claims priority, application Switzerland, Feb. 20, 1975, 2132/75

Int. Cl.[2] **C03C** *3/22, 3/04*

U.S. Cl. 106—39.6 **5 Claims**

1. A biocompatible glass ceramic consisting essentially of a Na_2O, CaO and SiO_2 vitreous matrix containing vitreous inclusions in which are dispersed crystals of a compound isomorphous with hydroxyapatite and having the formula $Ca_{(10-x)}M_x(Si_xP_{(6-x)})O_{24}F_2$, where x is 2 to 6 and M is a lanthanide or yttrium, and crystals of $Na_2Ca_2Si_3O_9$ and $Ca_3(PO_4)_2$.$2Ca_2SiO_4$ in said matrix, said crystals being present in an effective amount to permit bonding of said glass ceramic to bone, the glass ceramic being prepared from a mixture having the following molar percentage limits:

SiO_2 = 35 to 50
Na_2O = 20 to 30
CaO = 10 to 30
P_2O_5 = 2.5 to 10
lanthanide or yttrium oxide = 3 to 10
alumina = up to 5
sodium fluoride = up to 10
calcium fluoride = up to 5.

4,120,731
METHOD OF MAKING MOLTEN SILICON INFILTRATION REACTION PRODUCTS AND PRODUCTS MADE THEREBY

William B. Hillig, Ballston Lake, and Charles R. Morelock, Ballston Spa, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 23, 1976, Ser. No. 660,261

Int. Cl.[2] **C04B** *35/56*

U.S. Cl. 106—44 **3 Claims**

1. Machinable castings having a density of from 1.6 to 2.7 g/cm^3 which are the infiltration products of reaction under vacuum conditions and at a temperature of from 1400° C to 1700° C of molten silicon and a substantially uniform mixture consisting essentially of by volume

(A) from 45% to 90% of particulated carbon having up to an equal proportion by volume based on the volume of (A) of silicon carbide particles, and

(B) from 10% to 55% of particulated boron nitride.

4,120,732
OPTICAL GLASS

Fujio Komorita, Hachioji, and Muneo Nakahara, Sagamihara, both of Japan, assignors to Kabushiki Kaisha Ohara Kogaku Garasu Seizosho, Sagamihara, Japan

Filed Dec. 12, 1977, Ser. No. 860,024

Int. Cl.[2] **C03C** *3/12, 3/14*

U.S. Cl. 106—47 Q **2 Claims**

1. An optical glass consisting of a composition in weight percent of 10 to less than 17% B_2O_3, 20 to 55% La_2O_3, 0.5 to 38% Gd_2O_3, 0.5 to 32% WO_3, 0 to 10% ZrO_2, 0 to 30% Ta_2O_5, the total of said ZrO_2 and Ta_2O_5 being 2 to 35%, 0 to 5.5% SiO_2, 0 to 5% GeO_2, 0 to 16% Y_2O_3, 0 to 5% Tb_4O_7, 0 to 38% Yb_2O_3, the total of said Y_2O_3, Tb_4O_7, and Yb_2O_3 being 0 to 40%, 0 to less than 2% TiO_2, 0 to 31% Nb_2O_5, 0 to 3% SnO_2, 0 to 5% Al_2O_3, 0 to 5% In_2O_3, 0 to 5% Bi_2O_3, and an oxide or oxides selected from the group consisting of MgO, CaO, SrO, BaO, ZnO and PbO, the amount of or the total amount of said MgO, CaO, SrO, BaO, ZnO and PbO being 0 to less than 2%.

4,120,733
LEAD-FREE GLAZE FOR ALUMINA BODIES

Randy O. Knapp, Cottam, Canada, assignor to Champion Spark Plug Company, Toledo, Ohio

Filed Dec. 1, 1977, Ser. No. 856,225

Int. Cl.[2] **C03C** *5/02*

U.S. Cl. 106—48 **6 Claims**

1. A lead-free ceramic glaze for application to sintered high alumina substrates and maturing at temperatures from 1900° to 2200° F. consisting essentially of from 48 to 54 weight percent SiO_2, from 7 to 11 percent Al_2O_3, from 16½ to 20 percent B_2O_3, from 11 to 14 percent BaO, from 2 to 3 percent CaO, from 2 to 2½ percent ZnO, from 4¼ to 5¼ percent Na_2O, and from 0.4 to 1 percent K_2O.

4,120,734
MONOLITHIC REFRACTORY COMPOSITIONS

Taizo Taniguchi; Itsutoshi Iwasaki, both of Kita-kyushu; Toshihiko Takeshige, Shimonoseki; Koji Onizuka, and Soichi Hashiguchi, both of Kita-kyushu, all of Japan, assignors to Taiko Rozai Co. Ltd., Japan

Filed Nov. 8, 1977, Ser. No. 849,531

Claims priority, application Japan, Nov. 26, 1976, 51/142509

Int. Cl.[2] **C04B** *35/66*

U.S. Cl. 106—67 **1 Claim**

1. Monolithic castable refractory compositions used for lining various smelting furnaces or other industrial furnaces, molten metal containers and the like, comprising the following ingredients:

refractory clay:	3 – 12% by weight
metallic aluminum powder (purity = 90% or higher; particle size = 0.074mm or less for 50% or more by weight of the aluminum powder):	0.1 – 5.0% by weight
deflocculating agent:	0.01 ~ 1.0% by weight
coagulant:	1 ~ 8% by weight
reaction inhibitor for aluminum powder:	to be added in a quantity from 0.0 to 0.5% by weight
refractory aggregate with particle size adjusted:	balance

4,120,735

BRICK AND METHOD OF MAKING SAME

Robert H. Smith, Philadelphia, Pa., assignor to Gilbert Associates, Inc., Reading, Pa.

Continuation-in-part of Ser. No. 509,297, Oct. 25, 1974, abandoned. This application Jun. 7, 1976, Ser. No. 693,283

Int. Cl.[2] C04B 35/16

U.S. Cl. 106—84 2 Claims

1. The method of making a brick or similar fired construction unit comprising mixing about 50 to 60% inorganic substantially non-ferrous residue from municipal incinerators, by weight, which is milled and passed through a 4 mesh screen and composed of non-ferrous metal, glass and other non-metals, with the remainder of coal fly ash together with a binder of about 1 to 4% by weight, of the mixture, shaping, and firing the mixture at a temperature of between about 1700° and 1750° F. for about ½ hour to provide greater compressive strength and less water absorption than ordinary fly ash brick or clay brick with less firing temperature.

4,120,736

OIL WELL CEMENTING PROCESS AND COMPOSITION

Jerry D. Childs, and Roosevelt Love, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. No. 654,497, Feb. 2, 1976, Pat. No. 4,047,567. This application Feb. 28, 1977, Ser. No. 772,715

Int. Cl.[2] C04B 7/35

U.S. Cl. 106—90 2 Claims

1. A non-gelling hydraulic cement composition having a high degree of predictability containing a retarder for controlling rheology and setting time of hydraulic cement comprising a mixture of hydraulic cement, at least one water soluble hydroxy carboxylic acid and a low molecular weight sulfoalkylated lignin; wherein the weight ratio of said acid to lignin is in the range of about 1:0.1–5; wherein said carboxylic acid is a substantially linear aliphatic acid having at least one terminal carboxyl group in the form of acid, salt or mixtures thereof; and wherein said sulfoalkylated lignin has a molecular weight in the range of about 2,000–10,000 and which is substantially sulfoalkylated on the benzene ring of the lignin molecule in the position ortho to a hydroxy group and the sulfonate group is attached to the ortho position by an alkylidene radical having one to three carbon atoms.

4,120,737

MANUFACTURE OF CALCIUM SULPHATE ALPHA HEMIHYDRATE

John Sorbie Berrie, and Graham Edward Woolley, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Apr. 22, 1975, Ser. No. 570,946

Claims priority, application United Kingdom, May 3, 1974, 19444/74

Int. Cl.[2] C04B 11/00

U.S. Cl. 106—109 9 Claims

1. A process for the manufacture of calcium sulphate alpha-hemihydrate which comprises the step of reacting an aqueous solution of calcium chloride which is the calcium chloride/-sodium chloride containing liquor produced as a waste effluent in the ammonia soda process and sulphuric acid in an aqueous system at a temperature which is above the calcium sulphate hemihydrate/calcium sulphate dihydrate (gypsum) transition temperature under the reaction conditions.

4,120,738

LIGHT WEIGHT AGGREGATE AND METHOD FOR MAKING SAME

Dan C. Tate, Canton, N.C., assignor to Champion International Corporation, Stamford, Conn.

Filed Oct. 11, 1977, Ser. No. 841,011

Int. Cl.[2] C08L 97/00

U.S. Cl. 106—288 Q 7 Claims

1. A method for producing a light weight aggregate comprising the steps of

composing a mixture of caustic extract filtrate obtained from a kraft pulping process with fly ash and water to produce a wet agglomerate;

forming the wet agglomerate into discrete bodies; and

burning said bodies to form said light weight aggregate.

4,120,739

BUTT SPLICER FOR BUTT-JOINING A FRESH WEB TO A PROGRESSING WEB

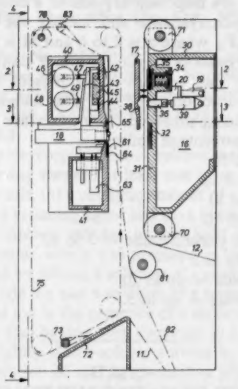
Emiel Adriaan Peeters, s'Gravenwezel, and Willy Lodewijk Pauwels, Schelle, both of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Nov. 2, 1976, Ser. No. 738,049

Claims priority, application United Kingdom, Nov. 19, 1975, 47696/75

Int. Cl.[2] B65H 21/00; G03D 15/04

U.S. Cl. 156—506 14 Claims



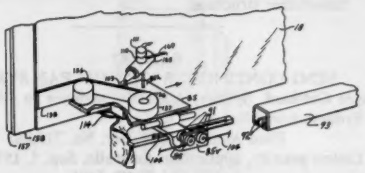
1. A butt splicer for butt-joining a fresh web to an expiring web, said splicer having portions thereof arranged to define adjacent aligned superposed paths for the webs, which splicer comprises relatively displaceable clamping means for clamping, preparatory to splicing, said web portions firstly along a common path and subsequently along separate paths, considered according to the direction of movement of the webs, cutter means arranged for displacement transversely of the webs for cutting both webs progressively transversely along a first line situated on said common path and for cutting one of said webs along a second line situated on a said separate path, means for removing the strip of said one web which is located between the two lines of cut, and means for applying a tape splice to the adjacent end portions of the webs produced by the cutting of the webs along said first line, while the webs are still clamped by the clamping means.

4,120,740

TAPE APPLICATOR FOR DRAPERY TABLER

Ronald Wade Morgan, 9509 Tiverton Way, Louisville, Ky. 40222, and David Lane Witherspoon, 2104 Evergreen Rd., Anchorage, Ky. 40223

Continuation-in-part of Ser. No. 648,166, Jan. 12, 1976, Pat. No. 3,996,083, which is a continuation-in-part of Ser. No. 505,619, Sept. 13, 1974, abandoned.
Filed Nov. 24, 1976, Ser. No. 744,646
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—522 7 Claims



1. A drapery manufacturing device, including:

A. a frame, having first and second spaced, plane-defining, parallel guide tracks;

B. a trolley, transversely spanning said tracks and movably connected thereto with respect to said frame and including a transverse member;

C. means on said transverse member of said trolley to grasp the hem edge of a panel to be formed into a drapery and to hold said panel in a plane on movement of said trolley with respect to said frame;

D. drive means to move said trolley with respect to said frame; and

E. reference means defining a reference plane adjacent to the lower end of said frame,

F. the improvement of a tape applicator means mounted adjacent to the lower end of said frame for transverse movement relative to said frame to adhesively apply one face of a reinforcing tape along the lower portion of said drapery panel so that said drapery panel may be folded over on itself along the line formed by said tape in such manner that said tape is sandwiched between the two layers of said panel to be secured to said layers of said panel and form a reinforced heading for said drapery panel.

4,120,741

CARTON SEALING STRIP APPLICATOR

Hans Rolf Ingemar Linnér, Helsingborg, Sweden, assignor to AB Akerlund & Rausing, Lund, Sweden

Continuation of Ser. No. 777,722, Mar. 15, 1977, Pat. No. 4,069,093. This application Oct. 17, 1977, Ser. No. 842,571
Claims priority, application Sweden, Nov. 12, 1976, 7612636
Int. Cl.[2] B26D *5/00;* B31B *1/72*
U.S. Cl. 156—522 8 Claims

1. Sealing strip applicator apparatus for use in a packaging machine in which a series of folding boxes is fed one after another in a predetermined direction with substantially constant center-to-center distances and a sealing strip is applied to at least one open end of each folding box, the sealing strip being formed by cutting a length from a continuous ribbon of sealing material, said apparatus comprising:

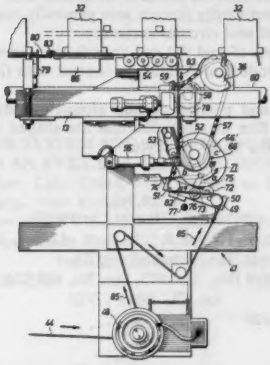
means for feeding said sealing ribbon parallel to at least first and second boxes;

means for adhering said ribbon to said open end of said first box when said first and second boxes are in a first position;

means for feeding said first and second boxes to a second position wherein said second box occupies the position previously occupied by said first box;

means for cutting said ribbon at the trailing edge of said first box at a cutting station with said first and second boxes in said second position; and

means responsive to the operation of said cutting means for withdrawing the sealing ribbon a distance equal to the distance between said first and second boxes so that the



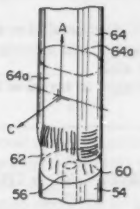
leading edge of said ribbon is aligned with the leading edge of said second box.

4,120,742

CAPACITANCE TYPE PICKUP STYLUS AND METHOD OF PRODUCING SAME

Akira Asano, and Keiji Segawa, both of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Japan

Filed Oct. 28, 1976, Ser. No. 736,392
Claims priority, application Japan, Oct. 30, 1975, 50/129779
Int. Cl.[2] G11B *3/44*
U.S. Cl. 156—608 6 Claims



1. A method of producing a pickup stylus of the capacitance type having a shaped tip for tracking and a flat side face with an electrode film coated thereon for the pickup of information signals, inscribed in a recording medium as geometric variations of a track, as variations in the capacitance between the recording medium and the stylus upon relative movement on the track, the method comprising the steps of:

growing by a modified edge defined film fed growth technique a single crystal of a hard mineral of a hexagonal system containing as an essential component aluminum oxide in the form of an elongated body having a substantially constant cross section; said modified edge defined film fed growth technique including the steps of (a) spreading a melt of said hard mineral as a film over a flat and circular surface through a capillary, the circular surface having a cross-sectional diameter no greater than about 0.3 mm and determining, but differing from the cross-sectional shape of the grown crystal, and (b) continuously growing said elongated body from said melt by vertically pulling up said film through the surface with a seed crystal of said hard mineral, said seed crystal being oriented such that an *a*-axis of said seed crystal coincides with the direction of the pullup of said seed crystal, whereby the longitudinal axis of said elongated body coincides with said *a*-axis of said single crystal and said

elongated body has a pair of inherently flat and smooth side faces both parallel to said longitudinal axis and normal to the *c*-axis of said single crystal, so that said cross section is defined by a pair of parallel straight lines with a spacing less than the diameter of said circular surface and a pair of outwardly convex arcs generally conforming to the edge of said circular surface;

on at least one of said flat and smooth side faces, forming a thin electrode film in intimate contact with the side face; and

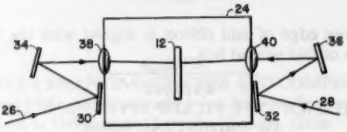
shaping an end portion of said elongate body with said electrode film thereon such that the shaped end portion serves as the tip of the stylus.

4,120,743

CROSSED GRAIN GROWTH

Aslan Baghdadi, and Ralph J. Ellis, both of Mesa, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 31, 1975, Ser. No. 645,574
Int. Cl.[2] B01J *17/12*
U.S. Cl. 156—620 **12 Claims**



1. A method for modifying the crystalline structure of a sheet of semiconductor material which comprises:

establishing a molten region at the edge of and extending through the thickness of said sheet;

moving said molten region across said sheet to an opposing edge of said sheet thereby creating a path of elongated crystal grains;

establishing a molten zone parallel to and abutting said path along a portion thereof and extending through the thickness of said sheet; and

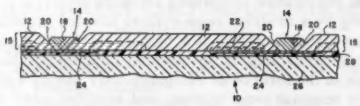
causing said molten zone to travel in a direction transverse to said path.

4,120,744

METHOD OF FABRICATING A THERMAL DISPLAY DEVICE

Thomas R. Payne, Plano; Harry K. James, and Millard M. Judy, both of Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 156,756, Jun. 25, 1971, abandoned. This application Jul. 26, 1973, Ser. No. 383,411
Int. Cl.[2] H01L *21/306*
U.S. Cl. 156—653 **4 Claims**



1. The method for fabricating a thermal display device which comprises:

selectively etching one face of a slice of monocrystalline semiconductor material to form a grid of moats and an array of mesas, the tops of said mesas lying substantially in a plane,

growing a relatively thick layer of oxide on the slice, the oxide layer being sufficiently thin to not fill the moats,

depositing a layer of polycrystalline semiconductor material on the oxide layer on said one face to provide a thick monolithic structure for processing,

then removing monocrystalline semiconductor material from the face opposite said one face of the slice to the depth of the oxide layer in the moats,

then forming circuit components in said mesas for converting said mesas into heat dissipating devices,

then forming electrical conductors on said opposite face for contacting said circuit components,

then mounting said device on an insulated substrate, and

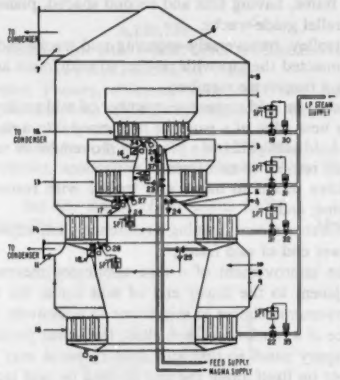
then removing only the polycrystalline semiconductor material and the layer of oxide overlying said plane while leaving sufficient polycrystalline semiconductor material and oxide in the moats to interconnect the mesas into a monolithic structure.

4,120,745

SEMI-CONTINUOUS VACUUM PAN SYSTEM

Detre Gotthard, Sydney, Australia, assignor to CSR Limited, Sydney, Australia

Filed Aug. 31, 1976, Ser. No. 719,083
Claims priority, application Australia, Sep. 1, 1975, PC 2997
Int. Cl.[2] B01D *1/06*
U.S. Cl. 159—27 B **12 Claims**



1. A low head semi-continuous vacuumm pan system for crystallising a substance from its solution; said system including a sequential array of individual vacuum pans, each pan having associated therewith a discharge volume, said discharge volume being measured as discharge levels of solution head in each pan and each pan being positioned in said array so that each discharge volume is greater than the discharge volume of an immediately preceding pan, and each pan further having: a heat supply means, a top-up solution supply means, and a means for transferring all its contents into an immediately following pan in said array when the volume of the contents of each pan reaches said associated discharge volume.

4,120,746

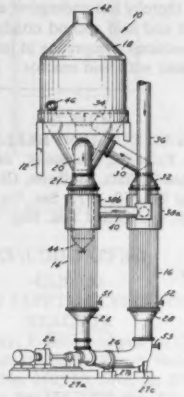
MULTIPLE STEAM CHEST SERIES FLOW EVAPORATOR

Reynard W. Gingrich, Fort Erie, Canada, assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Continuation of Ser. No. 539,138, Jan. 7, 1975, abandoned. This application Nov. 8, 1976, Ser. No. 739,759
Int. Cl.[2] B01D *1/12*
U.S. Cl. 159—47 R **13 Claims**

1. A method for evaporating a liquor comprising a solvent and a solute in a forced circulation evaporator, said evaporator comprising in combination an evaporation chamber equipped with liquor inlet and outlet and vapor discharge outlet, at least first and second heat exchangers each with liquor inlet and outlet interconnected in series for heating liquor, said heat exchangers positioned external to the evaporation chamber

and interconnected with the liquor inlet and outlet of the evaporation chamber, pump means for forcibly circulating heated liquor from the first exchanger to the second exchanger and to the evaporation chamber, said pump means being positioned between the liquor outlet of the first exchanger and the liquor inlet of the second exchanger, said evaporator including means for feeding liquor into the evaporator and product removal, said method comprising the steps of:



(a) feeding the liquor into the evaporator,
(b) heating the liquor to a temperature greater than its boiling point by forcibly circulating the liquor through the first and second heat exchangers,
(c) forcibly circulating the heated liquor from the heat exchangers to the evaporation chamber to vaporize and discharge a portion of the solvent, and
(d) removing concentrated product from the evaporator.

4,120,747

USE OF OZONE TREATED CHEMITHERMOMECHANICAL PULP IN A HIGH BULK TISSUE PAPERMAKING PROCESS

Henry David Sarge, III, Okeana, and David Charles Kleinschmidt, Wyoming, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 554,378, Mar. 3, 1975, abandoned. This application Jul. 18, 1977, Ser. No. 817,073
Int. Cl.[2] D21B *1/12*; D21C *9/00*
U.S. Cl. 162—117 **8 Claims**

1. A process for making soft, bulky, absorbent paper webs which comprises the steps of:

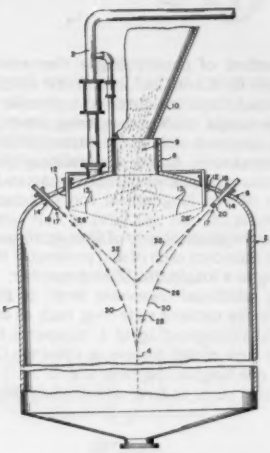
a. supplying an aqueous papermaking furnish comprising from about 5% to about 70% by weight of total fiber chemi-thermomechanical pulp having a modified Canadian standard freeness from about 500 to about 750 cc and consisting essentially of intact and lignin coated fibers, wherein said chemi-thermomechanical pulp has been prepared by treating wood chips with a liquor containing chemicals selected from the group consisting of sodium sulfite, sodium bisulfite, sodium carbonate, and mixtures thereof prior to defibration, and wherein said chemi-thermomechanical pulp has been treated with ozone subsequent to defibration;
b. forming an uncompacted paper web from said papermaking furnish;
c. supporting said uncompacted paper web on a conveying and imprinting fabric;
d. thermally predrying said uncompacted paper web to a fiber consistency of from about 30% to about 98%;
e. imprinting the knuckle pattern of said conveying and imprinting fabric into the thermally predried uncompacted paper web; and
f. finally drying the web so formed.

4,120,748

DIGESTER SYSTEM FOR DELIVERING WOOD CHIPS IN AN EVEN LAYER INTO A DIGESTER

Jerry Zucker, Lake Como, Fla., assignor to Hudson Pulp & Paper Corp., New York, N.Y.

Continuation of Ser. No. 565,567, Apr. 7, 1975, abandoned. This application Nov. 9, 1976, Ser. No. 740,315
Int. Cl.[2] D21C *7/06, 7/14*
U.S. Cl. 162—242 **7 Claims**



1. A digester for wood chips comprising, the combination of, a digester tank comprising a top wall with a central opening substantially smaller in diameter than said tank and through which a stream of wood chips can be delivered into said tank having a central vertical axis so that the chips fall centrally through the tank in a zone along said central vertical axis; spray means for supplying spray liquor transversely with respect to said tank and into said stream to intersect the entire width of said stream and wet said wood chips, said spray means for supplying spray liquor being located within said tank below the top wall of the tank and within a zone spaced radially outwardly relative to said axis and to the zone occupied by said stream of wood chips falling through the central opening in the top wall of the tank; and steam jet means, located adjacent to said spray means wherein said steam jet means comprises a plurality of nozzle units each of which projects a jet of steam downwardly and inwardly at an angle to a radial direction from said axis, with said jets being spaced circumferentially and cooperating with each other to produce a steam vortex, in a zone within said tank which is beneath the zone at which said liquor is sprayed on the wood chips falling through the tank, wherein the liquor is distributed and directed toward the axis of said vortex, and said liquor-wetted wood chips are separated from each other with movement produced by the steam vortex which is radial outwardly relative to said axis and with downward movement produced by gravity, said liquor-wetted wood chips being wetted by said liquor and falling downwardly and being distributed horizontally into a substantially even-topped layer in said tank.

4,120,749

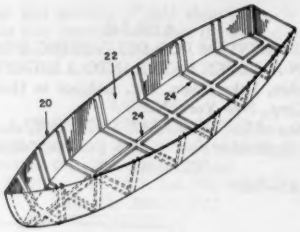
METHOD OF MAKING FIBER-REINFORCED PLASTIC UNITIZED BOAT HULL FRAME

Richard V. Humphrey, 10 Loring Ave., Kingston, Mass. 02364

Division of Ser. No. 599,848, Jul. 28, 1975, abandoned. This application Nov. 10, 1976, Ser. No. 740,653

Int. Cl.[2] B29D 9/00; B63B 5/24

U.S. Cl. 156—245 10 Claims



1. The method of constructing a fiber-reinforced plastic unitized frame for a boat hull, said frame comprising at least one longitudinal frame member and a plurality of transverse frame members, said method comprising the steps of:

a. forming a support mold of the exterior surface of said hull, said support mold having a plurality of plastic abhorent frame member portions corresponding to the shape and location of said longitudinal and said transverse frame members;

b. placing a longitudinal strip of fiber-reinforced plastic in an uncured state over each of said protions of the mold corresponding to a longitudinal frame member;

c. placing additional transverse strips of fiber-reinforced plastic in the uncured state over each of said portions of the mold corresponding to a transverse frame member wherein each of said transverse strips are in contact with at least one longitudinal strip; and

d. curing said strips to form said unitized frame.

4,120,750

NUCLEAR ENERGY PLANT WITH CLOSED WORKING GAS CIRCUIT

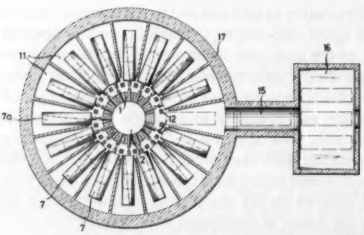
Siegfried Förster, Alsdorf; Peter Quell, Aachen-Haaren, and Berthold Sack, Aachen, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschrankter Haftung, Julich, Fed. Rep. of Germany

Filed Dec. 17, 1975, Ser. No. 641,538

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1974, 2460165

Int. Cl.[2] G21D 5/08

U.S. Cl. 176—60 7 Claims



1. A nuclear energy plant having a closed circuit for the working gas, which includes in combination: a nuclear reactor operated with a plurality of loops for working gas, each loop being formed as a structural unit comprising at least one turbo set for generating electric energy and circuit components for cooperation with said turbo set, said structural units radially surrounding said reactor in radially spaced relationship thereto, a plurality of first conduits respectively and independently of each other connecting said reactor with each structural unit for conveying hot working gas from said reactor to said turbo sets and subsequently through the respective pertaining circuit components, and a plurality of second conduits respectively and independently of each other leading from each structural unit to said reactor for conveying to said reactor working gas after the latter has passed through said circuit components and thereby has undergone a drop in temperature, said first conduit and said second conduit of each structural unit having connections comprising at least one shut-off valve to connect said unit with said reactor.

4,120,751

FUEL ELEMENT SKELETON

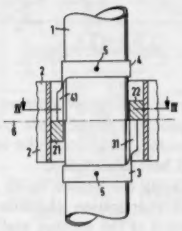
Helmut Bezold, Erlangen, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim, (Ruhr), Germany

Filed Feb. 10, 1977, Ser. No. 767,342

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1976, 2605594

Int. Cl.[2] G21C 3/30

U.S. Cl. 176—78 11 Claims



1. Fuel element skeleton having a play-free form-locking connection between groups of structural parts thereof respectively formed of materials of varying thermal expansion, the connection comprising means secured to a first group of the structural parts and having respective contact surfaces on diametrically opposite sides of the first group of structural parts, said contact surfaces being disposed in a common plane perpendicular to the longitudinal axis of said means, and said contact surfaces facing in mutually opposite axial directions of the first group of the structural parts, and means provided on a second group of the structural parts for defining respective abutment surfaces disposed in a common plane and mutually spaced from one another, said abutment surfaces facing in mutually opposite directions, said first and said second groups of the structural parts being disposed relative to one another in a position wherein the contact surfaces of said first group of the structural parts are in engagement with the respective abutment surfaces of said second group of the structural parts and wherein the common plane in which the contact surfaces are disposed in coincident with the common plane in which the abutment surfaces are disposed.

4,120,752

MIXED OXIDE FUEL PELLET FOR FUEL ROD OF NUCLEAR REACTOR CORE

Howard Ocken, Palo Alto, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

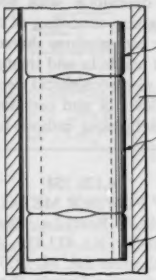
Filed Aug. 4, 1976, Ser. No. 711,758

Int. Cl.[2] G21C 3/30

U.S. Cl. 176—73 6 Claims

1. A mixed-oxide fuel pellet for a nuclear core fuel rod comprising: a body having an inner part and an outer part integral with and surrounding the inner part, the inner part containing a mixture of uranium oxide and plutonium oxide, the outer part containing uranium oxide free of plutonium

oxide and having an exposed outer surface, the body being insertable into a fuel rod of a nuclear reactor with the outer



surface of the outer part being contiguous to the inner surface of the rod.

4,120,753

SOLID ABSORBANT SAFETY DEVICE FOR A NUCLEAR REACTOR

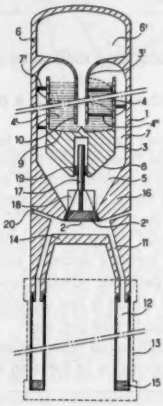
Claude Malaval, Antony, France, assignor to Groupement Atomique Alsacienne Atlantique, Le Plessis Robinson, France

Continuation of Ser. No. 416,140, Nov. 15, 1973, abandoned. This application Dec. 16, 1975, Ser. No. 641,323

Claims priority, application France, Nov. 21, 1972, 72.41261

Int. Cl.[2] G21C *7/06*

U.S. Cl. 176—86 R **3 Claims**



1. In combination, a water cooled reactor and a safety device, said reactor comprising:

water maintained under pressure within said reactor,

a core immersed in said water and comprising several elongated vertical guide tubes open to said water,

said safety device comprising:

a vertical cylindrical tank mounted above said core and immersed in said water,

conduit means connecting the bottom of said tank to said tubes,

means forming within said cylindrical tank, fluid connected, upper, lower and intermediate compartments,

absorbant in particulate form within said intermediate compartment,

an opening within said lower compartment providing fluid communication between said conduit means and said lower compartment,

fluid under pressure within said tank upper compartment,

a closing element closing off said opening at the bottom of said lower compartment, said closing element comprising a uranium plug brazed at its periphery by means of a fusible metal to the tank wall defining said opening;

whereby, in response to depressurization of the water within which said core and said tank are immersed, said plug is ejected by a pressure differential existing between said tank interior and exterior upon overheating of the brazed metal to initiate a rapid flow of pressurized fluid from said tank to said elongated guide tubes with fluid flow through said intermediate compartment fluidizing said particulate absorbant and forcing it to flow with said pressurized fluid through said conduit means and into said elongated guide tubes.

4,120,754

DETECTION OF ALKYLATING COMPOUNDS

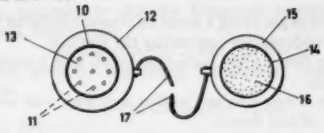
Anton Willem Barendsz, Katwijk aan Zee; Cornelis De Borst, Delft; Alfred Johannes Antonius Post, Alphen aan de Rijn, and Joannes Schimmel, Delft, all of Netherlands, assignors to Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek ten behoeve van de Rijksverdediging, The Hague, Netherlands

Filed Nov. 1, 1976, Ser. No. 737,189

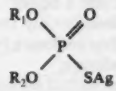
Claims priority, application Netherlands, Oct. 4, 1975, 7512939

Int. Cl.[2] G01N *31/14*

U.S. Cl. 195—99 **5 Claims**



1. A combined detection set for the detection of sulphur and nitrogen mustard gases, wherein the mustard gases to be determined are brought into contact with a silver salt of a thiophosphoric acid having the formula



in which R_1 and R_2 are members selected from the group consisting of alkyl having 1 to 10 carbon atoms, cycloalkyl and aryl having one ring under conditions whereby cholinesterase-inhibiting compounds are produced, and wherein the cholinesterase-inhibiting compounds are detected and/or determined by a chromogenous substrate for these compounds, wherein the set comprises:

(a) an adsorbing substrate strip, which successively has been impregnated with:

(1) a suspension of an adsorbing agent in water,

(2) a suspension or solution of said silver salt of the thiophosphoric acid in an organic solvent, and

(3) a cholinesterase solution in water, in an amount whereby the desired enzymatic activity on the substrate strip is obtained;

(b) an aqueous buffer solution, having a pH 7.5–8, and

(c) a second strip, impregnated with a cholinesterase-inhibiting detection amount of a chromogenous substrate.

4,120,755
KINETIC METHOD FOR DETERMINATION OF GLUCOSE CONCENTRATIONS WITH GLUCOSE DEHYDROGENASE

Kenneth J. Pierre, and Ker-Kong Tung, both of Vista, Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

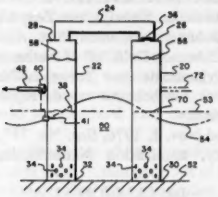
Filed Apr. 28, 1977, Ser. No. 791,825
Int. Cl.[2] G01N *31/14*
U.S. Cl. 195—103.5 C **14 Claims**

1. A kinetic glucose reagent of the type comprising a buffer, a pyridine coenzyme, and glucose dehydrogenase, characterized in that said buffer has a pH of from about 7.9 to about 9.0.

4,120,756
METHOD FOR PURIFYING A LIQUID BY PRESSURE DISTILLATION

Vincent E. Carman, 10728 NE. Halsey D-34, Portland, Oreg. 97220

Division of Ser. No. 656,431, Feb. 9, 1976, Pat. No. 4,035,241. This application Apr. 18, 1977, Ser. No. 788,622
Int. Cl.[2] B01D *3/02*
U.S. Cl. 203—11 **4 Claims**



1. A method of purifying a liquid by pressure-induced vaporization and condensation comprising the steps of:
(a) partially filling a first walled enclosure with a quantity of said liquid;
(b) partially filling a second walled enclosure with a second quantity of said liquid;
(c) filling the remainder of said first and second enclosures with vapor of said liquid;
(d) decreasing the pressure within said first enclosure to a value sufficient to cause a portion of said liquid contained therein to evaporate into a vapor, and simultaneously increasing the pressure within said second enclosure to a value sufficient to cause a portion of any vapor contained therein to condense into a liquid;
(e) transferring substantially only that vapor produced by evaporation in said first enclosure from said first enclosure into said second enclosure;
(f) removing from said second enclosure substantially only that liquid produced by condensation in said second enclosure; and
(g) repeating said steps (d) through (f) until a predetermined quantity of condensed liquid has been removed from said second enclosure.

4,120,757
METHOD OF MAKING SINTERED PLAQUE CADMIUM ELECTRODES

Harvey N. Seiger, and Vincent J. Puglisi, both of Waterford, Conn., assignors to Yardney Electric Corporation, Pawcatuck, Conn.

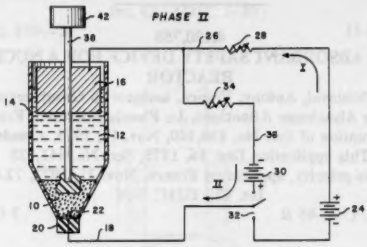
Filed Nov. 25, 1977, Ser. No. 854,928
Int. Cl.[2] C25D *9/08*; C25B *1/16, 11/06*
U.S. Cl. 204—2.1 **10 Claims**

1. An improved method of making sintered plaque cadmium electrodes, said method comprising:
a. electrochemically depositing cadmium hydroxide into the pores of a sintered nickel plaque cathode from a heated aqueous electrolyte at acid pH and at a controlled current density in a treating zone containing an anode;
b. at least periodically contacting said electrolyte during said electrochemical deposition with neutralizing agent selected from the group consisting of cadmium oxide, cadmium hydroxide and mixtures thereof to neutralize acid generated at said anode in said treating zone; and,
c. continuing said electrochemical deposition until an improved loading level of said cadmium hydroxide within said sintered nickel plaque cathode is obtained.

4,120,758
PRODUCTION OF POWDER METALLURGY ALLOYS

Ralph E. Rippere, 4145 W. Banff La., Phoenix, Ariz. 85023

Continuation-in-part of Ser. No. 611,810, Sep. 9, 1975, Pat. No. 4,046,643. This application Jul. 14, 1977, Ser. No. 815,762
Claims priority, application Canada, Sep. 7, 1976, 260613
Int. Cl.[2] C25D *5/18, 7/00, 5/50*
U.S. Cl. 204—10 **43 Claims**



1. A method of producing a multimetal alloy comprising the steps of:
(a) providing a cathode comprising a powder of at least a first metal;
(b) electro-depositing particles of at least a second metal onto said cathode from an electrolytic composition containing ions of said second metal by imposing direct electrical current on the electrolytic composition;
(c) continuing the electro-deposition of said particles until a desired multi-metal composition is obtained wherein the deposited metal forms a discrete, annular layer superimposed upon the cathodic powder base, the exterior layer being of a metal which is less chemically active than the metal of the cathode powder; and
(d) sintering the multi-metal composition below the melting point of the composition to form an alloy.

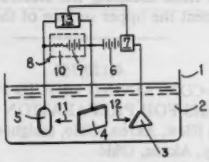
4,120,759
CONSTANT CURRENT DENSITY PLATING METHOD

Hiroshi Asami, and Masao Kaji, both of Otsu, Japan, assignors to New Nippon Electric Company, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 782,417, Mar. 29, 1977, Pat. No. 4,065,374. This application Sep. 13, 1977, Ser. No. 832,907
Claims priority, application Japan, Aug. 10, 1976, 5195872
Int. Cl.[2] C25D *1/00*; C25C *1/20*; C25D *21/12*; G05F *1/10*
U.S. Cl. 204—14 R **6 Claims**

1. A plating method comprising starting out with an electrolytic solution of uniform ion concentration in a plating bath, detecting the change in the electric resistance in said electrolytic solution between a standard or reference electrode and a constant current source, to produce a control output signal representing said resistance change, regulating the plating current in response to said control output signal to maintain a constant plating current density in said plating bath, interrupting the plating by repeated electrolysis steps which alternate with plating steps, applying during the electrolysis steps a

voltage to the bath which is higher than the plating voltage, and setting the duration of the electrolysis steps to be shorter



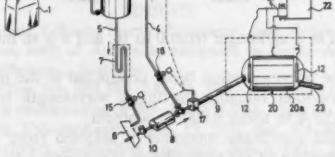
than the duration of the plating steps, whereby the piling-up of plating metal in places not supposed to be plated, is prevented.

4,120,760

SURFACE TREATMENT OF METALS

Kenji Ueda, Nagasaki, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1976, Ser. No. 662,418
Claims priority, application Japan, Mar. 20, 1975, 50-33604
Int. Cl.[2] C25D *3/22, 7/00;* C23F *14/00, 15/00*
U.S. Cl. 204—55 R 8 Claims



1. A method for imparting corrosion resistance to the surface of a metal body having a potential nobler than that of zinc coming into contact with sea water, comprising the steps of contacting said sea water with a sulfur dioxide-containing gas under conditions such that sulfurous acid is formed and reacts with the dissolved oxygen in said sea water to free said sea water of substantially all of said dissolved oxygen, contacting said sea water freed of dissolved oxygen with the surface of the metal body and forming with an anode a galvanic cell in which the said metal body is the cathode and the seawater freed of oxygen is the electrolyte, at least one of said anode and electrolyte containing zinc, said galvanic cell acting to coat said metal body with zinc without an accompanying deposition or crystallization of the hydroxide and carbonate constituents of said sea water.

4,120,761

ELECTROCHEMICAL PROCESS FOR THE PREPARATION OF ACETALS OF 2-HALOALDEHYDES

Donald A. White, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 15, 1977, Ser. No. 861,068
Int. Cl.[2] C25B *3/02;* C07C *41/10*
U.S. Cl. 204—59 R 16 Claims

1. A process for the preparation of acetals of 2-haloaldehydes which comprises subjecting a substantially anhydrous liquid electrolysis medium comprising a primary alcohol having at least one beta hydrogen atom and an anhydrous hydrogen halide selected from the group consisting of hydrogen chloride and hydrogen bromide to electrolysis in an electrolytic cell to yield the acetal of the 2-haloaldehyde corresponding to the primary alcohol.

4,120,762

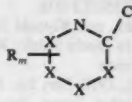
ELECTROCHEMICAL RECORDING MEDIUM

Sylvester Charles Sviokla, Ocean Bluff, Mass., assignor to Alden Research Foundation, Westboro, Mass.

Filed Sep. 30, 1977, Ser. No. 838,156
Int. Cl.[2] G01D *15/06, 15/10, 15/34*
U.S. Cl. 204—2 13 Claims

1. In an electrolytic recording medium comprising a porous support impregnated with an electrolytically conducting aqueous solution of a strong electrolyte

and a marking compound, the improvement comprising the addition of a six-membered hetero-aromatic nitrogen-containing compound of the formula:



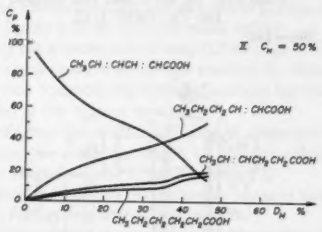
where each X is a member selected from the group consisting of nitrogen and carbon; and R is a member selected from the group consisting of hydrogen, halogen, hydroxyl, lower aliphatic radicals of 1–6 carbons, carboxyl, sulfo and alkoxy-radicals, said carboxyl, sulfo and alkoxy radicals being substituted with a member from the group consisting of hydrogen and lower aliphatic radicals of 1–6 carbons and *m* is a whole integer varying between 1 and 5.

4,120,763

HYDROGEN TRANSFER BY METAL HYDRIDE BETWEEN AQUEOUS MEDIUM AND ORGANIC COMPOUND

Frederic Breda, and Pierre Jonville, both of Geneva, Switzerland, assignors to Battelle Memorial Institute, Carouge-Geneve, Switzerland

Filed Jun. 9, 1977, Ser. No. 805,168
Claims priority, application Switzerland, Jun. 10, 1976, 7339/76
Int. Cl.[2] C25B *3/04, 11/04*
U.S. Cl. 204—73 R 4 Claims



1. A process for the continuous hydrogenation of an organic compound, comprising the steps of:

(a) disposing said organic compound in an aqueous electrolyte medium contained within an electrolysis cell provided with a cathodic working electrode and a counter-electrode, said cathodic working electrode comprising a metallic hydride whose metal component consists essentially of a first component selected from the group of titanium, zirconium, lanthanum and palladium and at least one second component selected from the group which consists of iron, nickel, cobalt, copper, chromium, manganese, vanadium, niobium and silver which composition is capable of exchanging hydrogen with said organic compound and said aqueous medium in a reversible manner such that said compound reacts with hydrogen from said metallic hydride and thereby undergoes hydrogenation and that said metallic hydride is regenerated by undergo-

ing an electrochemical reaction with said aqueous medium; and

(b) passing an electrolysis current through said cell between said electrodes so that said metallic hydride is regenerated by undergoing said electrochemical reaction while said organic compound undergoes hydrogenation, said electrolysis current being such as to provide substantially continuous hydrogenation of said compound by reversible exchange of hydrogen without release of gaseous hydrogen at said working electrode.

4,120,764

PROCESS FOR PRODUCING A TETRAALKYLTHIURAM DISULFIDE

Sigeru Torii; Hideo Tanaka, and Kiyoshi Mishima, all of Okayama, Japan, assignors to Ouchi Shinko Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

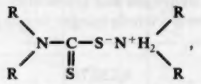
Filed Jan. 16, 1978, Ser. No. 869,409

Claims priority, application Japan, Jan. 20, 1977, 52-4375; Feb. 23, 1977, 52-18073

Int. Cl.[2] C25B *3/02*; C07C *155/10*

U.S. Cl. 204—78 **8 Claims**

1. A process for producing a tetraalkylthiuram disulfide which comprises electrolytically oxidizing a dialkylammonium dialkyldithiocarbamate having the formula



wherein each R represents an alkyl group having from 1 to 4 carbon atoms, in the presence or absence of a supporting electrolyte to produce a tetraalkylthiuram disulfide, said electrolytic oxidation being carried out in at least one solvent which dissolves at least one of the starting dialkylammonium dialkyldithiocarbamate and the resulting tetraalkylthiuram disulfide.

4,120,765

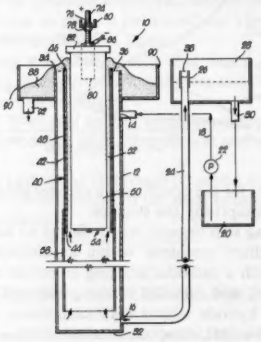
METHOD AND APPARATUS FOR PRODUCING FOAM

Arthur Shelley King, 8021 Cherokee La., Leawood, Kans. 66206

Filed Jun. 16, 1977, Ser. No. 807,051

Int. Cl.[2] C02C *5/12*

U.S. Cl. 204—149 **7 Claims**



1. In a method of producing foam by exposing a body of foamable liquid to electrolytic action from a pair of oppositely charged electrodes, the improvement comprising:

arranging the electrodes in an upright disposition and in adjacently opposed relationship;

placing the upright electrodes within the body of liquid so that both electrodes are substantially surrounded by the liquid;

circulating liquid upwardly between the electrodes from the body of liquid surrounding the electrodes; and

preventing bubbles generated by the electrodes during such circulation from escaping the electrodes at least until a point adjacent the upper surface of the body is reached.

4,120,766

HYDROXYL-CONTAINING LIQUID POLYMERS AND PROCESS FOR PREPARATION THEREOF

Changkiu Keith Riew, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 28, 1977, Ser. No. 782,104

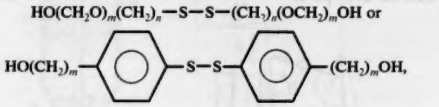
Int. Cl.[2] B01J *1/10*

U.S. Cl. 204—158 R **12 Claims**

1. A process for preparing a hydroxyl-containing liquid polymer containing an average from 1.1 to 4 hydroxyl groups per molecule, said polymer having an aliphatic backbone containing carbon-carbon linkages comprising at least 95% of total polymeric backbone weight, said process comprising polymerizing

(1) at least one vinylidene monomer having at least one terminal $CH_2{=}C<$ group, together with

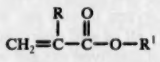
(2) at least one hydroxyl-containing disulfide having the formula



wherein *m* is an integer from 0 to 10, and *n* is an integer from 1 to 10,

(3) the polymerization being conducted in the presence of ultraviolet radiation having a wavelength from about 1,850 A to about 6,000 A, wherein

(4) said vinylidene monomer is selected from the group consisting of (a) monoolefins containing 2 to 14 carbon atoms, (b) dienes containing 4 to 10 carbon atoms, (c) vinyl and allyl esters of carboxylic acids containing 2 to 8 carbon atoms, (d) vinyl and allyl ethers of alkyl radicals containing 1 to 8 carbon atoms, and (e) acrylic acids and acrylates having the formula



said R being hydrogen or an alkyl or hydroxyalkyl radical containing 1 to 3 carbon atoms, and said R^1 being hydrogen, an alkyl or hydroxyalkyl radical containing 1 to 18 carbon atoms, or an alkoxyalkyl, alkylthioalkyl, or cyanoalkyl radical containing 2 to 12 carbon atoms.

4,120,767

PHOTOCHEMICAL METHOD FOR CARBON ISOTOPIC ENRICHMENT

Steven N. Bittenson, and Paul L. Houston, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

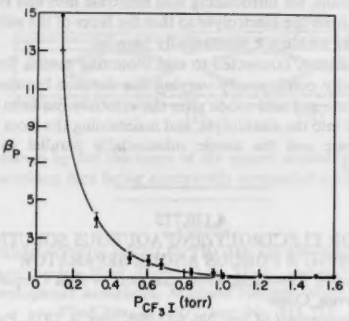
Filed Jun. 29, 1977, Ser. No. 811,217

Int. Cl.[2] B01J *1/10*

U.S. Cl. 204—158 R **20 Claims**

1. A photochemical method for selective carbon isotopic enrichment in a starting material comprising a gaseous mixture of at least two isotopic CF_3I species which comprises irradiating a gaseous isotopic mixture comprising said CF_3I at a pressure below about 10 torr in a reaction zone with laser radiation having an energy of at least about 0.1 joule/cm^2 and having a wavelength selectively coinciding with the absorption band of one but not the other of said CF_3I species, thereby selectively exciting and disproportionating said one species and causing it to form a reaction product other than said one species to pro-

vide relative enrichment of said other species; continuing said irradiation for a period of time to cause significant relative



enrichment of said other species; and recovering from the gaseous phase in said reaction zone unreactive isotopic starting material enriched in said other species.

4,120,768

PROCESS FOR ELECTROCOATING AQUEOUS COATING COMPOSITION COMPRISING DISPERSION IN WATER OF IONIZABLE SALT OF EPOXY AMINE ADDUCT

David Vincent Gibson, North Bayswater, and Bruce Leary, Frankston, both of Australia, assignors to Dulux Australia Ltd., Melbourne,, Australia

Division of Ser. No. 651,780, Jan. 23, 1976, Pat. No. 4,064,990, which is a continuation of Ser. No. 471,954, May 21, 1974, abandoned. This application Jun. 15, 1977, Ser. No. 806,826
Claims priority, application Australia, Jun. 4, 1973, 3548/73
Int. Cl.[2] C25D *13/06*
U.S. Cl. 204—181 C **4 Claims**

1. A method of depositing a coating composition on an electrically conductive substrate which comprises immersing said article in an aqueous coating composition consisting essentially of a dispersion in water of an ionizable salt of an epoxy-amine adduct and an acid together with a crosslinking agent for the adduct, characterized in that the ionizable salt consists of the combination of an acid and an epoxy-amine adduct selected from the compounds of the formulae

$$B_1 - A_1 - C_1 - A_2 - B_2 \quad (a)$$

and

$$B_{1-A1} - C_1 - A_2 C_2 - A_3 - B_2 \quad (b)$$

wherein

A_1, A_2 and A_3 are epoxy free residues of essentially straight-chain di-epoxides;

B_1 and B_2 and residues of primary or secondary mono-amines which have a pK_b value of 4 maximum;

C_1 and C_2 are residues of amines having one or two primary amino groups; and further characterized in that:

(1) the acid shall have a pK_a value of from 1.5–6.0, and if it is a carboxylic acid it shall contain not more than two carboxyl groups;

(2) at least 40% of the amine groups must be reacted with the acid, to form an amine salt; and

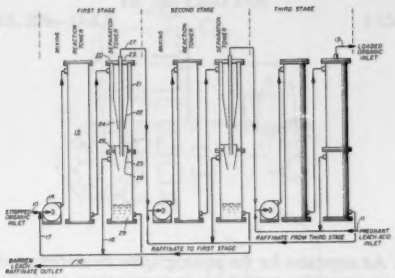
(3) the epoxy-amine adduct shall have a molecular weight of 1500 - 7000; making said substrate the cathode and passing electrical current between said substrate and a counter-electrode which is in electrical contact with said aqueous coating composition.

4,120,769

PROCESS FOR MIXING AND SEPARATION IN A SOLVENT EXTRACTION SYSTEM

Floyd Leon Prestridge, Tulsa, Okla., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jul. 27, 1977, Ser. No. 819,320
Int. Cl.[2] C25C *1/12;* **B03C** *5/00;* **C22B** *3/00, 15/00*
U.S. Cl. 204—186 **4 Claims**



1. A cyclic process for selectively recovering metals from a material containing other metallic values in addition to the selected metal, comprising,

(A) leaching said material with an aqueous leach solution;

(B) Recovering a pregnant, aqueous leach solution containing the selected metal and other metallic contaminants dissolved therein;

(C) intimately mixing the recovered aqueous leach solution with an organic medium containing a ligand which is capable of selectively extracting the selected metal from the aqueous solution, thereby producing a dispersion comprising an aqueous portion containing said other metallic and exchanged ions, and an organic portion containing the ligand and the selected metal values;

(D) passing the dispersion from step (C) through a flow path across which charged electrodes establish an electrostatic field which coalesces the drops of aqueous leach solution dispersed in the organic medium;

(E) centrifuging the electrically treated dispersion to agglomerate the coalesced drops of aqueous solution and separate them from the organic medium;

(F) recycling the agglomerated aqueous phase as leach solution for further leaching of said material;

(G) intimately mixing the organic phase from step (E) with an aqueous stripping solution which is capable of stripping the selected metal ions from the ligand of the organic phase, thereby producing a second dispersion comprising an aqueous portion containing the selected metal and an organic portion containing the ligand;

(H) passing the dispersion from (G) through a second flow path across which electrodes establish an electrostatic field which coalesces the drops of aqueous leach solution dispersed in the organic medium;

(I) centrifuging the electrically treated dispersion to agglomerate the coalesced drops of aqueous stripping solution and separate them from the organic medium;

(J) recycling the organic phase from step (I) as the organic medium containing a ligand to be mixed with further leach solution in step (C); and

(K) recovering the selected metal values from the aqueous stripping phase obtained in step (I).

4,120,770
APPARATUS FOR THE POLAROGRAPHIC MEASUREMENT OF OXYGEN

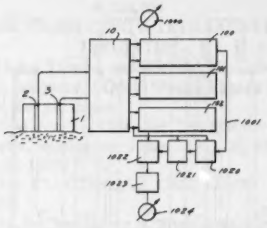
Manfred Kessler, Dortmund, Fed. Rep. of Germany, assignor to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V., Gottingen, Fed. Rep. of Germany

Filed Jul. 21, 1977, Ser. No. 817,663

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1976, 2632931

Int. Cl.[2] G01N *27/54*

U.S. Cl. 204—195 R **6 Claims**



1. An apparatus for the polarographic measurement of oxygen concentration comprising, in combination, a polarography electrode and a reference electrode for engagement with the medium to be analyzed, the polarography electrode having an effective diameter of 100 microns or more; first means operative when connected across the electrodes for effecting hydrogen generation within the medium and including a voltage source; second means operative when connected across the electrodes for effecting a polarographic measurement of hydrogen concentration; third means operative when connected across the electrodes for effecting a polarographic measurement of oxygen concentration; and switchover means operable for connecting the first, second and third means, in succession, across the electrodes.

4,120,771
DEVICE FOR MANUFACTURING SUBSTANTIALLY FLAT DIES

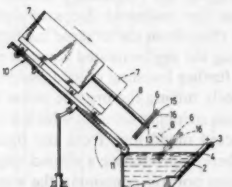
Léon Dewallens, Louvain, Belgium, assignor to Fabrication Belge de Disques "Fabeldis", Molenbeek-Saint-Jean, Belgium

Filed Sep. 7, 1977, Ser. No. 831,351

Claims priority, application Belgium, Sep. 10, 1976, 170518

Int. Cl.[2] C25D *17/06, 21/12*

U.S. Cl. 204—225 **10 Claims**



1. A device for manufacturing dies or counterparts for gramophone records using a substrate composed of a material of low electrical conductivity which has been previously metallized, comprising:

a container for containing an electrolyte;

at least one anode having a generally planar face mounted in said container;

means to mount the substrate so that its face is generally parallel to the face of said anode;

a cathode current supply, connected to said mounting means, so as to cause the substrate to function as a cathode;

introducing and removing means, connected to said mounting means, for introducing said substrate into and removing it from the electrolyte so that the faces of the substrate and the anode are substantially parallel;

driving means, connected to said mounting means, for substantially continuously varying the distance between the substrate and said anode after the substrate has been introduced into the electrolyte, and maintaining the faces of the substrate and the anode substantially parallel to each other.

4,120,772
CELL FOR ELECTROLYZING AQUEOUS SOLUTIONS USING A POROUS ANODE SEPARATOR

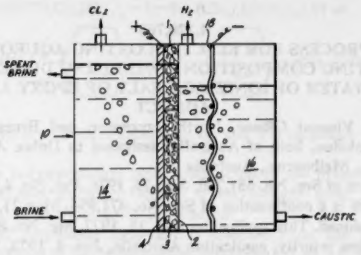
Igor V. Kadija, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 627,995, Nov. 3, 1975, Pat. No. 4,032,427. This application Apr. 26, 1977, Ser. No. 791,087

The portion of the term of this patent subsequent to Jun. 28, 1994, has been disclaimed.

Int. Cl.[2] C25B *11/06, 13/04*

U.S. Cl. 204—252 **22 Claims**



1. A cell for electrolyzing alkali metal chloride solutions comprised of an anode compartment, a cathode compartment, an anode separator dividing the anode compartment from the cathode compartment, a cathode in the cathode compartment, where the anode separator comprises a porous plate of a valve metal selected from the group consisting of titanium, tantalum, and niobium, said porous plate having a face, a back and an interior structure, said face having an electrochemically active coating selected from the group consisting of a platinum group metal, a platinum group metal oxide and mixtures thereof, said back and a portion of said interior having an electrochemically non-active barrier layer comprising a mixture of an oxide of titanium, tantalum, or niobium and a ceramic oxide selected from the group consisting of silicon oxide, aluminum oxide, magnesium oxide, calcium oxide, and mixtures thereof, wherein said portion is at least 10 percent of said interior structure.

4,120,773
COMPRESSIBLE SELF GUIDING ELECTRODE ASSEMBLY

John E. Ridgway, Lewiston, N.Y., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

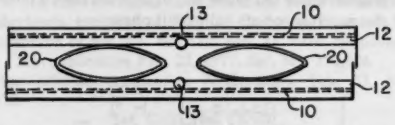
Filed Aug. 25, 1977, Ser. No. 827,635

Int. Cl.[2] C25B *9/04, 11/00, 15/04*

U.S. Cl. 204—252 **12 Claims**

1. A compressible electrode assembly for an electrolytic cell comprising in combination at least two opposed electrode working faces, separated by a compressible, resilient insulating elastic means, at least two sets of spacer assembly guides attached to the working faces that when the electrode assembly is inserted into a cell, compression occurs by the spacer assem-

bly guides contacting complementary electrodes, the gap between the complementary electrode and working face being



determined by the thickness of the spacer assembly guide and said working face being electrically connected to the cell.

4,120,774

REDUCTION OF ELECTRODE OVERVOLTAGE

Thomas Gordon Hart, Royal Oak, Mich., assignor to Energy Development Associates, Madison Heights, Mich.

Filed Jan. 24, 1977, Ser. No. 761,722
Int. Cl.[2] C25B *11/12*; C25D *17/10*
U.S. Cl. 204—294 **9 Claims**

1. A method of decreasing the halogen overvoltage of a carbon electrode which comprises contacting said electrode with nitric acid for an effective overvoltage reducing length of time of about 10–1200 hours.

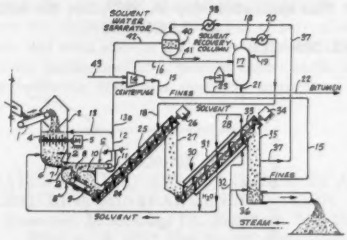
7. A carbon substrate exhibiting a decreased oxidation and reduction halogen overvoltage produced by the process of claim 1.

4,120,775

PROCESS AND APPARATUS FOR SEPARATING COARSE SAND PARTICLES AND RECOVERING BITUMEN FROM TAR SANDS

Robert G. Murray, Palo Alto, and Benjamin J. Gikis, Los Altos Hills, both of Calif., assignors to Natomas Company, San Francisco, Calif.

Filed Jul. 18, 1977, Ser. No. 816,506
Int. Cl.[2] B03B *5/36*; C10G *1/00*; C10C *1/18*; B01D *11/02*
U.S. Cl. 208—11 E **7 Claims**



1. In the solvent extraction of bitumen from sand wherein a tar sand is extracted with a solvent, said sand comprising a mixture of coarse and fine particles, and wherein after extraction the sand is separated from the resulting bitumen solution, the improvement which comprises:

(a) providing a slurry of sand and bitumen solution resulting from admixture of tar sand with a tar solvent;

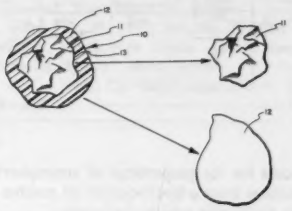
(b) passing such slurry in a generally horizontal stream through a first conduit having a generally horizontal bottom wall, then over an open space overlying and communicating with an underlying body of solvent, then into a second conduit having a generally horizontal bottom wall which is located at a lower level than the bottom wall of said first conduit, the relative rate of passage of the slurry over said open space being such as to cause coarse particles of sand to settle through said open space into said underlying body of solvent and to cause fine particles to continue with the stream into said second conduit rather than settling out with the coarse sand particles.

4,120,776

SEPARATION OF BITUMEN FROM DRY TAR SANDS

Jan D. Miller, and Jaime E. Sepulveda, both of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah

Filed Aug. 29, 1977, Ser. No. 828,357
Int. Cl.[2] C10G *1/04*
U.S. Cl. 208—11 LE **4 Claims**



1. A process for displacing bitumen from grains of sand in a tar sand having a negligible quantity of connate water comprising the steps of:

obtaining a tar sand having a negligible quantity of connate water;

comminuting the tar sand to obtain particles of tar sand; and

digesting the particles of tar sand to displace bitumen from the grains of sand comprising the steps of:

preparing a digestion solution comprising an aqueous solution of caustic wetting agent, the caustic wetting agent being present in the digestion step in a concentration within the range on the order of about 0.2 normal to 1.0 normal thereby maintaining the pH above about 10;

maintaining the temperature of the digestion solution within the range on the order of about 70° C. to the boiling point of the digestion solution; and

displacing bitumen from the grains of sand with a high shear environment by mixing the particles of tar sand with the digestion solution in an amount to provide a solids concentration within the range on the order of about 50 to 80%, the displacing step further comprising agitating the mixture thereby providing the high shear environment for displacing the bitumen from the grains of sand.

4,120,777

PROCESS FOR RECOVERY OF BITUMINOUS MATERIAL FROM TAR SANDS

Alfred R. Globus, Bayside, N.Y., assignor to Guardian Chemical Corporation, Hauppauge, N.Y.

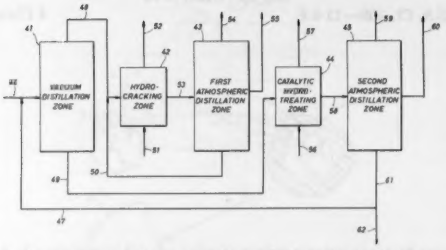
Filed Jul. 13, 1976, Ser. No. 704,843
Int. Cl.[2] C10G *1/04*
U.S. Cl. 208—11 LE **16 Claims**

1. A process for the recovery of bituminous matter from tar sands comprising admixing said tar sands with water and 0.5–5% by weight of an alkali or alkaline earth metal bicarbonate salt, mixing the slurry thus produced and thereafter withdrawing said bituminous material extracted from said tar sands.

4,120,778
PROCESS FOR THE CONVERSION OF HYDROCARBONS IN ATMOSPHERIC CRUDE RESIDUE

Frans Goudriaan, and Jakob Van Klinken, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 9, 1977, Ser. No. 831,850
Claims priority, application Netherlands, Sep. 22, 1976, 7610510
Int. Cl.[2] C10G *39/00, 13/06*
U.S. Cl. 208—80 8 Claims



1. A process for the preparation of atmospheric hydrocarbon oil distillates from a hydrocarbon oil residue obtained by atmospheric distillation which comprises:

(a) fractionating said residue by vacuum distillation into a vacuum distillate and a vacuum residue,

(b) cracking said vacuum distillate in a cracking zone comprising either a catalytic cracking zone or a hydrocracking zone to obtain a cracked product,

(c) fractionating said cracked product by atmospheric fractionation distillation into at least one light distillate product, a cracked intermediate fraction and a cracked residue, and recycling at least part of said cracked intermediate fraction or said cracked residue to the cracking zone of step (b),

(d) hydrotreating the vacuum residue from step (a) in a catalytic hydrotreating zone under such conditions that more than 50% by weight of the total feed to the catalytic hydrotreating zone is converted to a product having a lower boiling point than the feed,

(e) fractionating said hydrotreated product by atmospheric fractionation distillation into at least one light atmospheric distillate product, a hydrotreated intermediate fraction and a hydrotreated residue,

(f) fractionating said hydrotreated residue by vacuum distillation into a vacuum distillate and a hydrotreated vacuum residue, and then,

(g) recycling at least 50% by weight of the hydrotreated vacuum residue from step (f) to the cracking zone of step (b).

4,120,779
PROCESS FOR DESULFURIZATION OF RESIDUA WITH SODAMIDE-HYDROGEN AND REGENERATION OF SODAMIDE

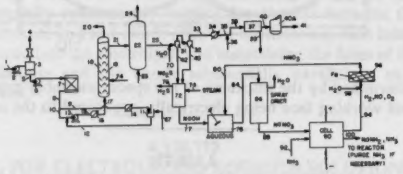
William Chalmers Baird, Jr.; Roby Bearden, Jr., and Ralph Louis Bollinger, Jr., all of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 571,955, Apr. 28, 1975, Pat. No. 4,017,381.
This application Aug. 11, 1976, Ser. No. 713,628
Int. Cl.[2] C10G *13/06;* B01J *23/04, 23/90*
U.S. Cl. 208—108 10 Claims

1. A process for the desulfurization and hydroconversion of a sulfur-containing petroleum oil feedstock, which comprises;

contacting a sulfur-containing petroleum oil feedstock, in a desulfurization-hydroconversion zone, with sodamide in the presence of added hydrogen at a temperature of from between 400°–2,000° F, said feedstock being maintained substantially in the liquid phase, thereby forming an oil-salt mixture comprising a sulfur-reduced oil phase and a salt phase, said salt phase comprising sodium sulfur salts;

contacting said mixture with water to form an aqueous sodium sulfur salt phase and to separate the oil phase from the aqueous sodium sulfur salt phase;



converting said aqueous sodium sulfur salts to sodium chloride;

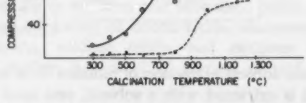
converting said sodium chloride to sodamide; and

returning at least a portion of the so-regenerated sodamide to said desulfurization-hydroconversion zone.

4,120,780
CATALYSTS FOR HYDRODEMETALLIZATION OF HYDROCARBONS CONTAINING METALLIC COMPOUNDS AS IMPURITIES AND PROCESS FOR HYDRO-TREATING SUCH HYDROCARBONS USING SUCH CATALYSTS

Tatsuo Morimoto, Yokohama; Munekazu Nakamura, Kamakura; Masayoshi Inooka, and Teizaburo Yawata, both of Yokohama, all of Japan, assignors to Chiyoda Chemical Engineering & Construction Co., Ltd., Yokohama, Japan

Division of Ser. No. 704,020, Jul. 9, 1976, Pat. No. 4,075,125.
This application May 26, 1977, Ser. No. 800,909
Int. Cl.[2] C10G *23/02*
U.S. Cl. 208—211 3 Claims



1. A process for hydrodemetallization of hydrocarbons containing metallic compounds as impurities, comprising contacting hydrogen and hydrocarbons containing metallic compounds as impurities with a catalyst at a temperature of from 300° C. to 500° C. and a hydrogen pressure of from 10 to 300 kg/cm², said catalyst having been prepared by admixing red mud with from 1 to 10% by weight based on the weight of the red mud of a member selected from the group consisting of alumina; clay, alumina-yielding substance and mixtures thereof, said admixture being shaped and calcined at a temperature of 600° C. to 1,100° C., the feed rate of said hydrocarbons being from 0.1 to 20 parts by volume of said hydrocarbons per hour for unit part by volume of said catalyst and the feed rate of said hydrogen being 89 to 1780 Normal liters of hydrogen per liter of said hydrocarbons.

4,120,781

PROCESS FOR REDUCING THE LEVEL OF RADIOACTIVITY OF A STREAM OF LIGHT HYDROCARBONS

Swan T. Sie, and Franciscus H. J. Bukkems, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 660,532, Feb. 23, 1976, abandoned.
This application Feb. 22, 1977, Ser. No. 770,726
Claims priority, application Netherlands, Feb. 21, 1975, 7502072
Int. Cl.[2] C10G *25/00*
U.S. Cl. 28—251 R 16 Claims

1. A process for reducing the level of radioactivity of a stream of light hydrocarbons comprising, passing a stream of light hydrocarbons containing radioactive metals or compounds thereof through a space containing solid particles containing, in sulfidic form, one or more metals from Group VI B, alone, or combined with one or more metals from Group VIII B of the Periodic Table, the stream of hydrocarbons being passed through at a temperature lower than 100° C. and at a space velocity of 0.1–110 kg per hour per liter of space filled with solid particles.

4,120,782

METHOD FOR IMPROVING THE TREATING CAPACITY OF A CLAY SORBENT

Costandi A. Audeh, Princeton, N.J., and Tsoung-Yuan Yan, Philadelphia, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 3, 1978, Ser. No. 866,747
Int. Cl.[2] C10G *25/12*
U.S. Cl. 208—305 10 Claims

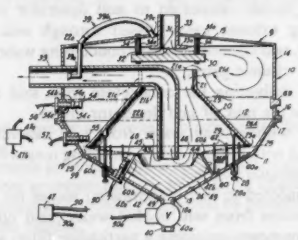
1. A process for (1) increasing the capacity of a solid sorbent used in a finishing unit for oils of lubricating viscosity and for (2) effecting the removal of undesirable organo-polar compounds from lubricating oils in contact with said sorbent in paid finishing unit comprising (a) continuously removing sorbent from said finishing unit, (b) contacting said sorbent from step (a) with anhydrous acid gas until an effective amount of said gas is adsorbed therein (c) returning the sorbent from step (b) to the finishing unit and (d) contacting said oil and sorbent under suitable removal conditions of temperature and pressure until substantially all of said undesirable compounds are removed from the oil thereby improving the quality of said oil and wherein said solid sorbent is a clay selected from attapulgite, bentonite, kaolin, kaolinite, bauxite, fullers earth, halloysite, montmorillonite, illite and synthetic amorphous silica-aluminas.

4,120,783

APPARATUS AND PROCESS FOR ORDINARY AND SUBMARINE MINERAL BENEFICIATION

George P. Baummer, 25 Strabane Ct., Baltimore, Md. 21234

Filed Jul. 5, 1977, Ser. No. 812,460
Int. Cl.[2] B03B *5/02*
U.S. Cl. 209—18 47 Claims



1. Process for the recovery of heavy constituents from particulate material carried in a transporting fluid forming a slurry, comprising:

(a) passing said slurry along a prescribed path;

(b) directing said slurry in a first zone from said prescribed path and thence back toward said path so as to subject the slurry to centrifugal force for progressively throwing certain particulate material out of the path of travel of said slurry;

(c) collecting said particulate material which is thrown out of said slurry and directing the same along a second prescribed path while agitating said particulate material; and

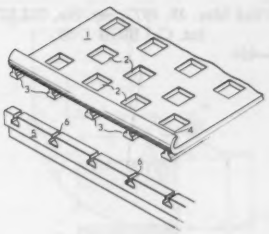
(d) collecting the heaviest portion of the agitated particulate material.

4,120,784

SCREENING APPARATUS

Anthony George Hassall, Sandiway, England, assignor to N. Greening Limited, Warrington, England

Filed Feb. 28, 1977, Ser. No. 773,036
Claims priority, application South Africa, Jun. 16, 1976, 76/3584; Australia, Jun. 17, 1976, 14997
Int. Cl.[2] B07B *1/46*
U.S. Cl. 209—399 11 Claims



1. Screening apparatus including a screening surface formed of one or more plates of flexible nonmetallic material having apertures therethrough, a plurality of attachment bars projecting from the underface of the or each plate at intervals along the length thereof, each attachment bar extending in the direction of the width of the plate, and a support structure for supporting said plate or plates, said support structure including a plurality of spaced support bars running transversely of the attachment bars and provided at intervals along their length corresponding to the intervals of the attachment bars with slots of a shape to receive the attachment bars of the plate or plates.

4,120,785

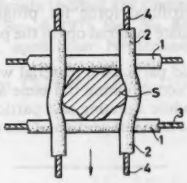
RUBBER SCREENS FOR VIBRATORY SCREENING APPARATUS

Katsuo Kanamori, Kobe; Nobuo Sakurai, Nishinomiya, and Ryozo Arai, Kobe, all of Japan, assignors to Mitsuboshi Belting Limited, Kobe, Japan

Filed Feb. 23, 1977, Ser. No. 771,274
Claims priority, application Japan, Feb. 23, 1976, 51-20996[U]; Mar. 6, 1976, 51-26616[U]
Int. Cl.[2] B07B *1/28*
U.S. Cl. 209—401 51 Claims

1. A rubber screen for a vibratory screening apparatus, comprising a plurality of first parallel rope members having suitable cross-sectional shapes and arranged in a particle flowing direction, each of said first rope members having a tensile member composed of a strand of filaments having a high elongation at break and an organic material having flexibility and/or elasticity covering said tensile member, and a plurality of second parallel rope members having suitable cross-sectional shapes and arranged in a direction normal to said first rope members, each of said second rope members having a tensile member of a material having a low elongation at break and an

organic material having flexibility and/or elasticity and covering said tensile member; each of the points of intersection between said first and second rope members being suitably



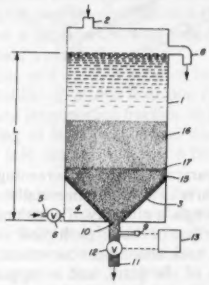
bonded, the elongation at break of said first parallel rope members as a whole being greater than the elongation at break of said second parallel rope members as a whole.

4,120,786

SEPARATION OF MIXED ION EXCHANGE RESINS

George E. Petersen, Fremont, and James M. Dotson, Danville, both of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Mar. 29, 1977, Ser. No. 782,327
Int. Cl.[2] B03B 5/66
U.S. Cl. 209—454 **18 Claims**



1. A method for separating a mixture of cation and anion exchange resins from each other comprising the steps of:

hydroclassifying the cation and anion resins by introducing the mixture of resins and a carrier fluid to a treatment zone in a countercurrent flow,

monitoring the pH of the resins in the treatment zone, a change in the pH of the resins indicating the position of an interface between the separated cation and anion resins, and

removing the separated cation resin from a level in the treatment zone below the interface between the separated cation and anion resins until the pH of the resin being removed becomes basic, and thereafter

removing the separated anion resin from the treatment zone.

4,120,787

FUEL CELL WATER CONDITIONING PROCESS AND SYSTEM AND DEAERATOR FOR USE THEREIN

Brian A. Yargeau, East Windsor Hill, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 29, 1976, Ser. No. 755,336
Int. Cl.[2] C02B 1/10, 1/40
U.S. Cl. 210—26 **23 Claims**

1. A method for the treatment of fuel cell condensate, said method enabling the use of the condensate as feed water for a steam generator, the steam generator including a boiler and providing steam to a reformer which produces a fuel for the fuel cell from a raw material supplied thereto, said method comprising the steps of:

transferring heat from fuel cell exhaust gases to water in a deaerator tank, dissolved gases being released from said water through the heating thereof, the fuel cell exhaust gases including water vapor;

condensing the water from the exhaust gases subsequent to their use in heating water in the deaerator tank;

delivering the condensate to the deaerator tank for heating;

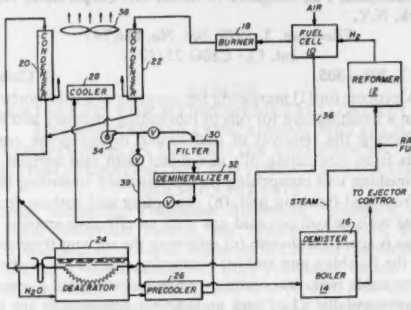
drawing water from the deaerator tank;

cooling the water drawn from the deaerator tank;

treating the cooled water to remove therefrom materials which would have a deleterious effect on the steam generator or reformer; and

delivering the treated water to the boiler of the steam generator.

13. In a fuel cell power plant, the power plant including a reformer for producing fuel for a fuel cell from hydrocarbon materials supplied thereto, the power plant additionally including a steam generator which supplies process steam to the reformer, improved apparatus for the purification of water produced as a by-product of the generation of electricity through an electro-chemical reaction in the fuel cell, the water



exiting the fuel cell in the form of water vapor entrained with hot exhaust gases, said improved water purification apparatus comprising:

deaerator means, said deaerator means including a tank in which liquid is heated to drive off dissolved gases and a heat exchanger disposed in said tank;

means for delivering moisture laden fuel cell exhaust gases to the heat exchanger of said deaerator means whereby fuel cell waste heat provides the requisite thermal energy for operation of said deaerator means;

condenser means connected to said deaerator means and receiving exhaust gases passed through said heat exchanger, said condenser means condensing water from the fuel cell exhaust gases;

means for delivering the condensate from said condenser means to the tank of said deaerator means;

means for withdrawing water from said deaerator means tank, said withdrawing means including means for cooling the withdrawn water;

means connected to said withdrawing means for removing contaminates from said cooled water, said contaminate removing means including a particulate filter; and

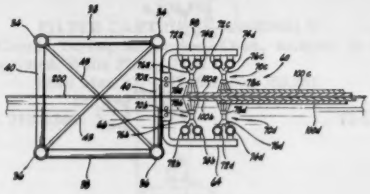
means for delivering water passed through said contaminate removing means to the power plant steam generator.

4,120,788

OIL SLICK REMOVAL AND RECOVERY SYSTEM

Robert D. Ellis, P.O. Box 340, Flora, Ill. 62839

Filed May 23, 1977, Ser. No. 799,213
Int. Cl.[2] C02B 9/02
U.S. Cl. 210—30 A 20 Claims



3. A method of removing oil from a water surface comprising the steps of:

(a) forming a floatable, oil sorbent foam layer below the oil,

(b) forming a floatable, oil sorbent foam layer above the oil to cooperate with the first layer to form a floating foam sandwich,

(c) allowing the foam layers to contact the oil under and upper surfaces to absorb the oil, and

(d) removing the oil impregnated foam sandwich from the water.

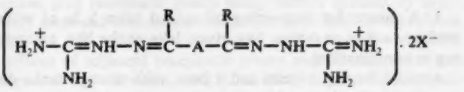
4,120,789

METHOD FOR THE PURIFICATION OF SEWAGE WATERS WHICH CONTAIN ORGANIC COMPOUNDS OF AN ANIONIC NATURE

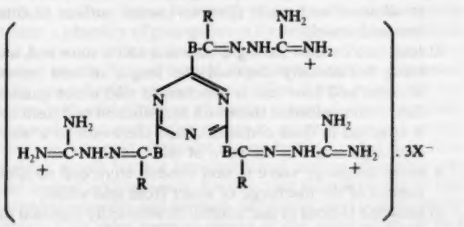
Raffaele Fusco, Milan, Italy, assignor to ANIC, S.p.A., Palermo, Italy

Filed Feb. 15, 1977, Ser. No. 768,837
Claims priority, application Italy, Feb. 23, 1976, 20456 A/76
Int. Cl.[2] C02B 1/20; C02C 5/02
U.S. Cl. 210—54 5 Claims

1. The method of purifying sewage water by removing therefrom an anionic organic compound contained therein that reacts with a bis-guanylhydrazonium or tris-guanylhydrazonium salt represented by the formulae:



or



wherein:

R is hydrogen or an aliphatic chain having from 1 to 3 C, atoms,

A represents aromatic rings connected through heteroatoms to other aromatic rings or to aliphatic chains,

B represents an aromatic ring bound by oxygen atoms to the triazine system,

X^- represents an anion consisting of Cl^-, Br^-, OSO_4H^-, NO_3^-, $CH_3SO_3^-$ or $Ar—SO_3^-$,

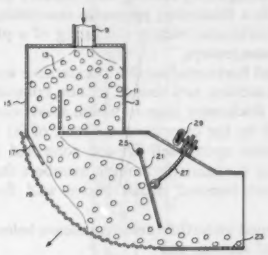
to form a saline derivative that is very poorly water-soluble, which comprises adding to said sewage water an effective quantity of at least one of said bis-guanylhydrazonium or tris-guanylhydrazonium salts so that a precipitate and a supernatant liquor are formed, and then decanting said supernatant liquor.

4,120,790

SYNTHETIC RUBBER DEWATERING APPARATUS AND METHOD

Donald Tinker, Bonnet Bay, and Keith E. Berg, Lurnia, both of Australia, assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 28, 1977, Ser. No. 810,836
Int. Cl.[2] B01D 25/04
U.S. Cl. 210—65 8 Claims



1. An apparatus for dewatering rubber crumb slurry, said apparatus comprising:

(a) a concave surfaced screen sloping downward and attached to

(b) a chute leading away from the screen;

(c) a collecting vessel depended beneath the screen in a manner to collect material passed through the screen;

(d) a means for directing an inlet feedstream downward toward said screen; and

(e) means for controlling direction and amount of slurry flow comprising:

(1) a first baffle fixed in relation to the inlet line and the screen to direct inlet flow away from the screen toward the face of

(2) an adjustable second baffle, downstream of said first baffle, with

(3) means for adjustment of said second baffle both to redirect slurry flow from the first baffle onto the screen and to limit the spacing between the screen and the second baffle thereby restricting slurry flow from the screen surface onto the chute.

8. A method for removing water from water crumb slurry, said method comprising directing said slurry downward toward a concave surfaced screen onto means for controlling direction and amount of slurry flow comprising:

(1) a fixed baffle directing the slurry flow away from the screen toward the face of

(2) a second baffle, said second baffle being adjustable, adjusting said second baffle to redirect the slurry flow onto the screen and to limit the spacing between the screen and the second baffle thereby restricting slurry flow along the screen surface, while controlling the amount of water from said slurry which passes through said screen.

4,120,791

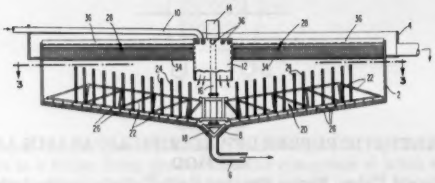
SLUDGE THICKENER APPARATUS AND METHOD

Francis C. Wright, Yardville, N.J., assignor to IU Conversion Systems, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 645,944, Jan. 2, 1976, abandoned. This application Sep. 28, 1977, Ser. No. 837,317

Int. Cl.[2] B01D *21/06*

U.S. Cl. 210—84 **8 Claims**



1. A method for separating a relatively solids-free effluent and a relatively high solids concentration thickened underflow from a feed comprising a solid-liquid mixture of sufficiently high solids concentration to be a hindered settling material, said method comprising feeding said mixture to and treating said mixture in a thickening apparatus comprising

(I) a first horizontal section consisting of a plurality of inclined passageways,

(II) a second horizontal section coextensive with and below said first section, said second section consisting of a compressive thickening zone in which solids concentration is increased by the compressive effects of (a) the solids-liquid mixture upon itself in said zone and (b) vertically projecting horizontally moving members therein,

(III) effluent removal means above said first horizontal section,

(IV) thickened underflow removal means below said second horizontal section, and

(V) means for introducing influent hindered settling solids feed between said first and second horizontal sections whereby incoming feed partitions itself into a heavier fraction immediately being distributed at the top of said compressive thickening zone for further thickening and a lighter fraction immediately rising through said inclined passageways,

said inclined passageways being adapted to receive a predominantly upflowing liquid from said feed mixture and to form a presettled solids deposit which flows downwardly into said compressive thickening zone, the solids concentration and flow rate of feed being adapted to provide relatively slow liquid upflow rates and relatively long solids detention time in said compressive thickening zone with a resultant enhancement of solids liquid separation efficiency relative to solids loading rate, the remainder of said method comprising removing from the top of said apparatus a relatively solids-free effluent and from the bottom of said apparatus a thickened high solids concentration underflow.

4,120,792

COMBINED FILTER AND INCINERATOR

Dwight P. Clark, Tremonton, and William F. Wagner, Brigham City, both of Utah, assignors to Thiokol Corporation, Newtown, Pa.

Filed Aug. 15, 1977, Ser. No. 824,575

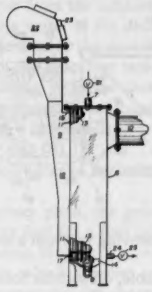
Int. Cl.[2] C02C *3/00*

U.S. Cl. 210—152 **10 Claims**

1. A combination filter and incinerator for waste water treatment, comprising:

an enclosure having inlet and outlet ports for hot air and inlet and outlet ports for waste water;

at least one porous, tubular, refractory, filter-grate in the enclosure, closed at one end and connected at the other end to the waste-water outlet port, so that waste water entering the enclosure from the inlet port must pass through the walls of the filter-grate in order to be discharged through the waste water outlet port, whereby solid particles in the waste water become deposited on the outer surface of the filter-grate;



a source of forced, hot air, connected to the hot air, inlet port, and capable of incinerating solid waste particles on the filter grate; and

means for alternately introducing waste water and heated air into the enclosure.

4,120,793

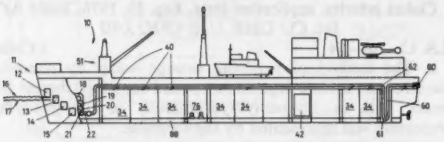
POLLUTING OIL RECOVERY APPARATUS

Patrick J. Strain, 27 Tanglewood Dr., Ottawa, Ontario, Canada

Filed Nov. 3, 1975, Ser. No. 627,846

Int. Cl.[2] E02B *15/04*

U.S. Cl. 210—175 **1 Claim**



1. A means for recovering oil spilled upon a large water surface such as an ocean, bay, river, lake or the like, comprising in combination;

a vessel having a stern and a bow with storage tanks disposed therebetween;

a plurality of sluice gates opening on either side of said bow to allow oil and water from said water surface to enter into said vessel;

at least one conduit having a bow end and a stern end, and being horizontally disposed the length of said vessel, wherein said bow end is attached to said sluice gates in fluid communication therewith and wherein said stern end is attached in fluid communication therewith to a water discharge means at the stern of said vessel;

a water discharge valve in said conduit stern end to allow control of the discharge of water from said vessel;

at least one U-bend in said conduit downwardly disposed the depth of said vessel and located adjacent the stern thereof;

suction pump means constructed and arranged to draw an oil and water mixture into said sluice gates and pump said mixture along said conduit;

a steam jacket surrounding said conduit to heat the said mixture therein; baffle means in said conduit downwardly and forwardly adjustable from an upper side of said conduit to entrap a layer of oil therein while water is drawn out along the lower side of said conduit,

and pipe means having one open end therein entering and communicating with said conduit proximate the upper

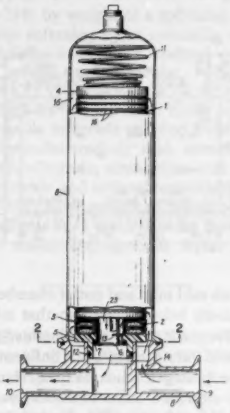
side thereof adjacent the forward facing portion of each baffle means, and having another end communicating with a storage tank, and pump means to draw off said layer of oil entrapped in said conduit and to conduct it through said pipe to said storage tank.

4,120,794

FILTER CARTRIDGE ASSEMBLY

Bruce George Taylor, Kensington, Conn., assignor to AMF Incorporated, White Plains, N.Y.

Filed Mar. 31, 1977, Ser. No. 783,231
Int. Cl.[2] B01D *25/18, 27/00*
U.S. Cl. 210—345 **12 Claims**



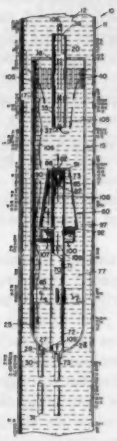
1. A filter cartridge assembly employing base means at a first end and closure means having a fluid output port at a second opposite end, filter media in the form of a series of individual filtration elements serially disposed between said base means and said closure means, cooperating with one another to define a total effective filtration area, said cartridge assembly including: disc shaped filter media receptacle means for positioning each of said filtration elements between adjacent receptacle means; said receptacle means being further defined by oppositely disposed downstream and upstream fluid flow surfaces, each of said surfaces cooperating with respective opposite surfaces of adjacent receptacle means and filtration elements disposed therebetween, said filtration elements each respectively disposed with an area defined by first and second concentrically spaced flange means formed on said downstream surface; orifice means centrally formed of said receptacle means; a plurality of passage ways formed on said downstream and upstream surfaces for fluid flow to said orifice means; first sealing means formed on said downstream surface concentrically spaced with respect to said first flange means for coaction with said filtration elements; spaced abutments serially disposed about said orifice means in proximity to said second flange means, said abutment means forming radial fluid flow passage means leading into individual orifices extending into said central orifice means, for directing fluid flow out of said cartridge assembly and through said output port in said closure means; fluid inlet passage means at the outer edge of said receptacle means being formed between spaced abutment means on said upstream surface; third flange means extending away from said upstream surface formed about said central orifice means, said third flange means being engagable with second flange means of an adjacent receptacle means to interlock said receptacle means, whereby each of said filtration elements are fixedly positioned between respective downstream and upstream surfaces of adjacent receptacle means; second sealing means concentrically spaced from said third flange means formed on said upstream surface; positioning means adapted to be disposed within said orifice means for positioning respective receptacle means and filtration elements in stacked aligned relationship with respect to one another, said positioning means extending between said base means and said closure means being fixedly engagable with said closure means under a compressive load for urging each of said filtration elements to seal at the points of contact with said first and second sealing means of said receptacle means to isolate said downstream and upstream fluid flow passage ways.

4,120,795

DEVICE FOR SEPARATING A PLURAL PHASE FLUID SYSTEM INTO ITS CONSTITUENT PHASES

Claude C. Laval, Jr., 2444 N. Farris Ave., Fresno, Calif. 93705

Filed Dec. 5, 1977, Ser. No. 857,437
Int. Cl.[2] B01D *21/26*
U.S. Cl. 210—512 R **19 Claims**



1. A device for separating a fluid system containing at least two phases having different specific gravities comprising:

(A) a vortexing chamber having upper and lower end portions and a sidewall having an inwardly disposed surface of revolution concentric to a longitudinal axis for the chamber, said upper end portion having an emitting passage concentrically therethrough;

(B) means for supplying such a fluid system into the upper end portion of the vortexing chamber tangentially to said axis so that the fluid swirls downwardly in the chamber to centrifuge portions of the heavier phase outwardly for descent in the chamber to the lower end portion thereof and said fluid then swirls upwardly through the emitting passage; and

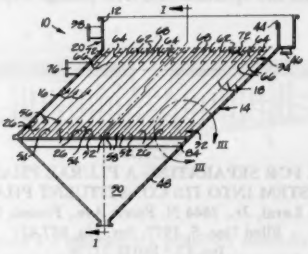
(C) a plate mounted transversely of said axis concentrically of the chamber and with the lower end portion of the chamber defining a settling compartment, said plate having an opening therepast adjacent to said sidewall to admit the fluid containing the centrifuged portions of said heavier phase to the compartment, and said plate having an auxiliary passage therethrough concentrically of said axis juxtapositioned to the emitting passage whereby the fluid swirling upwardly to and through said passage draws fluid from the settling compartment through the auxiliary passage to reduce the pressure in the settling compartment and facilitate settling of the heavier phase therein.

4,120,796

VERTICAL FLOW INCLINED PLATE CLARIFIER

Werner P. E. Huebner, 6 Sweetbriar Ct., Toronto, Ontario, Canada (M4A 2G5)

Filed Mar. 1, 1977, Ser. No. 773,436
Int. Cl.[2] B01D *21/00*
U.S. Cl. 210—522 **16 Claims**



1. In a clarifier having inclined flow passages formed by a plurality of spaced apart, inclined parallel plates mounted within a housing, the clarifier being adapted for upflow operation with the housing forming a sediment chamber below the inclined plate and means at the upper end of the plates for receiving effluent, the improvement comprising

a flow regulating channel assembly for regulating flow of influent into the respective flow passages from a separate influent chamber formed by the housing,

a portion of the housing forming openings adjacent the lower ends of the inclined plates for respectively communicating the influent chamber with each inclined flow passage,

each flow regulating channel assembly including

an elongated plate spaced apart from the lower inclined surface of each clarifier plate adjacent its lower inclined end, the elongated plate forming an enclosed region together with the lower inclined surface of the spaced apart clarifier plate, the enclosed region being in comminication with the influent chamber through one of said openings,

upper and lower flow restricting passage means being arranged above and below the elongated plate and extending substantially along the length of the elongated plate to limit flow from the upper and lower ends respectively of the enclosed region while communicating the enclosed region with both the respective flow passage and sediment chamber, the amount of flow limitation produced by the upper and lower flow restrictions being selected so that influent liquid entering the enclosed region from the separate influent chamber tends to be distributed uniformly across the respective flow passage and to flow upwardly from the enclosed region while suspended solids settling out of the influent liquid within the enclosed region tend to pass downwardly through the lower flow restriction toward the sediment chamber.

4,120,797

CROSS-FLOW INCLINED PLATE CLARIFIER

Werner P. E. Huebner, 6 Sweetbriar Ct., Toronto, Ontario, Canada (M4A 2G5)

Filed Mar. 1, 1977, Ser. No. 773,321
Int. Cl.[2] B01D *21/10*
U.S. Cl. 210—522 **28 Claims**

1. An inclined plate clarifier comprising

a housing having generally horizontal, spaced-apart support beams in a lower portion thereof,

a plurality of clarifier plates arranged transversely upon said support beams, lateral edges of said plates being adjacent opposite end walls of said housing,

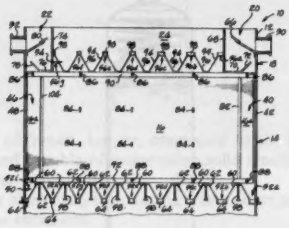
spacer means for maintaining said clarifier plates in inclined and parallel space-apart relation to each other to form inclined flow passages therebetween,

a vertical inlet divider plate extending transversely across said inclined plates and supported thereupon adjacent one housing end wall to form an inlet chamber above said inclined plates,

said housing forming an inlet conduit in communication with said inlet chamber,

a vertical outlet divider plate arranged transversely above said inclined plates and supported thereupon adjacent the other housing end wall to form an oulet chamber above said inclined plates,

means forming inlet and outlet channels adjacent said opposite housing end walls respectively below and in commu-



nication with said inlet and outlet chambers, said inlet and outlet channels being formed so that influent from said inlet chamber tends to enter said inclined flow passages by means of said inlet channel and influent exiting said inclined flow passages tends to pass through said outlet channel to enter said outlet chamber, and

said housing forming an outlet conduit in communication with said outlet chamber,

the construction and arrangement of said clarifier plates and said inlet divider plate and outlet divider plate being suitable for arrangement within said housing so that they are maintained in place upon said support beams under the influence of gravity, thereby facilitating their installation and removal from the housing.

4,120,798

FLAME RETARDANTS FOR SYNETHETIC MATERIALS

Vladimir Mischutin, East Brunswick, N.J., assignor to White Chemical Corporation, Bayonne, N.J.

Continuation-in-part of Ser. No. 538,896, Jan. 6, 1975, abandoned, and a continuation-in-part of Ser. No. 797,767, May 17, 1977. This application Jun. 22, 1977, Ser. No. 808,956
The portion of the term of this patent subsequent to Apr. 15, 1992, has been disclaimed.
Int. Cl.[2] C09K *3/28*
U.S. Cl. 252—8.1 **16 Claims**

1. A composition for rendering a disperse dyeable, synthetic, heat stable thermoplastic, substantially hydrophobic polymeric substrate in the form of fibers or fabrics, flame retardant, that comprises:

a water-insoluble organic flame retardant brominated compound, having a melting point above 100° C.; and a particle size of 10 microns or less in diameter;

an aqueous medium wherein said fire retardant compound is suspended; one or more surfactants; and

an inert, organic, water-soluble protective colloid in an amount sufficient to maintain said flame retardant compound in suspension in said aqueous medium.

4,120,799

COMPOSITIONS FOR SOURING AND SOFTENING LAUNDERED TEXTILE MATERIALS, METHOD OF PREPARING THE SAME, AND STOCK SOLUTIONS PREPARED THEREFROM

John D. Ciko, Allen Park; John J. Cramer, and Geoffrey A. Jamieson, both of Wyandotte, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 545,382, Jan. 30, 1975, Pat. No. 4,053,423. This application May 26, 1977, Ser. No. 800,795
Int. Cl.[2] D06M *13/10*
U.S. Cl. 252—8.6 29 Claims

1. A stable homogeneous liquid composition for souring laundered textile materials and imparting softness thereto consisting essentially of

I. About 0.5–25% by weight of a softening agent for textile materials, the softening agent consisting essentially of an aqueous emulsion of partially oxidized emulsifiable polyethylene having a molecular weight of about 1,000–10,000;

II. About 3–50% by weight of an acidic souring agent for laundered textile materials selected from the group consisting of hydrofluorosilicic acid, ammonium silicofluoride, zinc silicofluoride, ammonium acid fluoride, potassium acid fluoride and orthophosphoric acid; and

III. About 25–96.5% by weight of water;

the said ingredients I, II and III being present in amounts whereby a stable homogeneous liquid composition is produced.

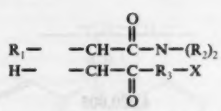
4,120,800

OIL RECOVERY AND MOBILITY CONTROL USING SUCCINAMATE SURFACTANT SYSTEMS

Joseph J. Valcho, Naperville, and Robert E. Karll, Batavia, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Aug. 25, 1977, Ser. No. 827,563
Int. Cl.[2] E21B *43/22*
U.S. Cl. 252—8.55 D 27 Claims

1. A method for recovering oil from an oil-bearing formation which comprises injecting into the formation an aqueous fluid to displace the oil in the formation containing from about 1 to 15 percent by weight of the aqueous fluid of a water soluble succinamate surface-active agent having the following general formula:



wherein R_1 is alkenyl having an average molecular weight in the range of from about 150 to about 600; each R_1 is independently selected from the group consisting of hydrogen, lower alkyls, hydroxyl-substituted lower alkyls and hydroxyl-substituted ethoxylated lower alkyls; R_3 is selected from the group consisting of O or O—SO_3; and X is a cation.

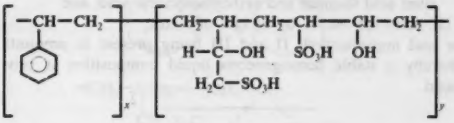
4,120,801

WATERFLOODING PROCESS EMPLOYING ANIONIC-NONIONIC COPOLYMER

Catherine S. H. Chen, Berkeley Heights; Frederick C. Schwab, Metuchen, and Edward W. Sheppard, Lambertville, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 23, 1977, Ser. No. 799,487
Int. Cl.[2] E21B *43/22*
U.S. Cl. 252—8.55 D 5 Claims

1. In a method of recovering oil from an oil-containing subterranean formation penetrated by an injection well and a production well and wherein an aqueous fluid is injected via said injection well into said formation to displace said oil to said production well, the improvement comprising employing in at least a portion of said aqueous fluid injected via said injection well into said formation a water soluble copolymer in an amount sufficient to thicken said portion of said aqueous fluid and improve the efficiency thereof in displacing said oil to said production well, said copolymer having a molecular weight within the range of 50,000 to 500,000 and having long sequences of an oil soluble nonionic segment formed of polymer blocks of a styrene monomer and long sequences of a water soluble anionic segment formed of polymer blocks of a butadiene monomer chemically modified to provide a hydroxysulfonate group thereon as the anionic function, said copolymer having the following structural formula:



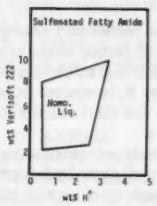
where the ratio of *x*:*y* is equal to or less than 1.

4,120,802

COMPOSITIONS FOR SOURING AND SOFTENING LAUNDERED TEXTILE MATERIALS, METHOD OF PREPARING THE SAME, AND STOCK SOLUTIONS PREPARED THEREFROM

John D. Ciko, Allen Park; John J. Cramer, and Geoffrey A. Jamieson, both of Wyandotte, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

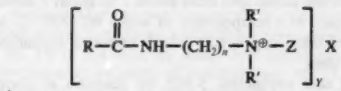
Division of Ser. No. 545,382, Jan. 30, 1975, Pat. No. 4,053,423. This application May 26, 1977, Ser. No. 800,624
Int. Cl.[2] D06M *13/40*
U.S. Cl. 252—8.75 30 Claims



1. A stable homogeneous liquid composition for souring laundered textile materials and imparting softness thereto consisting of

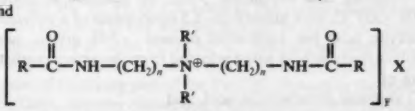
I. about 0.5–25% by weight of a softening agent for textile materials, the softening agent consisting of at least one quaternized fatty amide corresponding to the following structural formulae

1.



and

2.



wherein R is selected from the group consisting of monovalent alkyl radicals and sulfonated monovalent alkyl radicals containing about 8–22 carbon atoms, R′ is selected from the group consisting of monovalent alkyl radicals and sulfonated monovalent alkyl radicals containing about 1–3 carbon atoms, Z is selected from the group

consisting of monovalent alkyl radicals and sulfonated monovalent alkyl radicals containing 1–22 carbon atoms, n is about 1–6, X is an anion selected from the group consisting of halide, sulfate, phosphate, alkyl sulfates having about 1–3 carbon atoms in the alkyl group and alkyl phosphate having about 1–3 carbon atoms in the alkyl group, and Y is an integer having a numerical value equivalent to the valency of X;

II. about 3–50% by weight of an acidic souring agent for laundered textile materials selected from the group consisting of hydrofluorosilicic acid, ammonium silicofluoride, zinc silicofluoride, ammonium acid fluoride, potassium acid fluoride and orthophosphoric acid; and

III. about 25–96.5% by weight of water;

the said ingredients I, II and III being present in amounts whereby a stable homogeneous liquid composition is produced.

4,120,803

LUBRICANT COMPOSITION CONTAINING A DISPERSANT WHICH IS A CONDENSATION PRODUCT OF A COPOLYMER, POLYAMINE AND A POLYCARBOXYLIC ACID

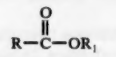
Robert E. Malec, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Nov. 15, 1976, Ser. No. 741,782
Int. Cl.[2] C10M *1/36, 3/30*
U.S. Cl. 252—51.5 A **18 Claims**

1. An oil soluble lubricating oil dispersant which is made by:

(A) copolymerizing a mixture of

(i) about 3–55 mole percent of a material having the formula



wherein R is an olefinically unsaturated hydrocarbon radical of up to 25 carbon atoms in which the carboxyl group is separated from all olefinic bonds by at least two carbon atoms and R_1 is selected from the group consisting of hydrogen and alkyl radicals containing 1 to about 15 carbon atoms,

(ii) about 5 to 80 mole percent of a conjugated diethylenically unsaturated aliphatic hydrocarbon of 4 to about 12 carbon atoms, and

(iii) about 92 to 15 mole percent of a monoalkene of 3 to about 30 carbon atoms, said material and said monoalkene being selected such that the total number of carbon atoms in these compounds is at least 12, said copolymerization being conducted at a temperature of about 0°–50° C. to form an intermediate copolymer,

(B) reacting said intermediate copolymer with at least 1.1 equivalents of a hydrocarbyl polyamine containing 2 to about 12 carbon atoms and from about 2 to about 7 amine nitrogen atoms at a temperature of about 60°–320° C. to form an amidated copolymer which contains unreacted >NH and then

(C) coupling said unreacted >NH by reaction at about 100°–300° C. with about 0.01–1.5 equivalents of a polycarboxylic acid per equivalent of said >NH group, said polycarboxylic acid being selected from the group consisting of

(i) aliphatic dicarboxylic acid, and

(ii) aromatic polycarboxylic acid containing an aryl group of about 6–10 carbon atoms and having 2 to 3 carboxylic groups bonded to said aryl group, said aliphatic dicarboxylic acid and aromatic polycarboxylic acid including precursor compound which yield said aliphatic dicarboxylic acid and said aromatic polycarboxylic acid under reaction conditions.

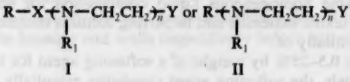
4,120,804

ASHLESS OIL DISPERSANTS

William L. Smith; Jacqueline S. Kelyman, both of Midland, Mich., and Ladell Jones, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 7, 1977, Ser. No. 774,821
Int. Cl.[2] C10M *1/32*
U.S. Cl. 252—47.5 **12 Claims**

1. A lubricating oil or a petroleum-based fuel for a combustion engine comprising a small but sufficient amount to impart detergency of an oil-soluble polymer of the formula



I II

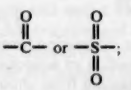
wherein

(a) R is a saturated or substantially saturated polyolefin having a molecular weight of at least about 250;

(b) R_1 is hydrogen or

wherein R_2 is hydrogen or alkyl of from 1 to about 18 carbon atoms with the proviso that at least about 60 percent of the R_1 groups are

(c) X is



(d) Y is a terminal organic or inorganic group; and

(e) n is an average value of from about 2 to about 15.

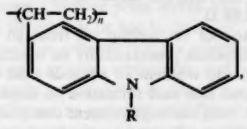
4,120,805

ELECTROPHOTOGRAHIC LIQUID DEVELOPER CONTAINING NEGATIVELY CHARGED TONER

Hiroshi Yamashita; Sadao Osawa; Takashi Saida, and Yutaka Sakassi, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 2, 1977, Ser. No. 792,954
Claims priority, application Japan, Apr. 30, 1976, 51-48418
Int. Cl.[2] G03G *9/12*
U.S. Cl. 252—62.1 L **10 Claims**

1. An electrophotographic liquid developer containing a negatively charged toner, which developer is produced by the process which comprises: adding a solution (A) of a high-molecular weight compound having a molecular weight of about 500 to about 1,000,000 consisting essentially of a skeletal structure selected from the group consisting of:



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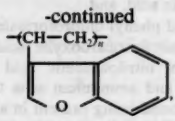

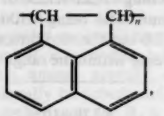

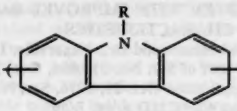

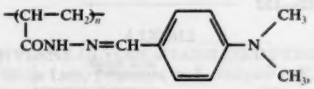

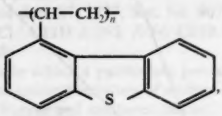

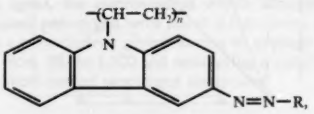

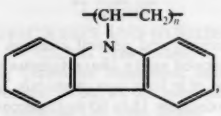

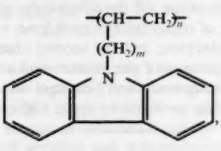

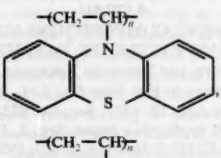

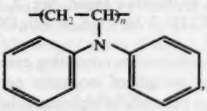

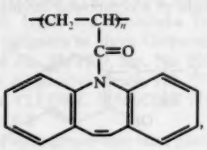

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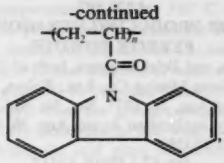
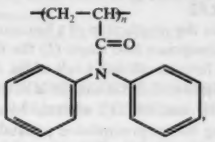
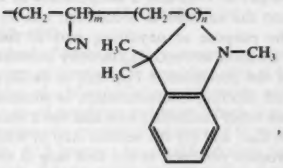






, and

wherein N and the sum of $m + n$ each ranges from about 5 to about 10^4 and the ratio m/n ranges from about 1:40 to about 50:1, where R is an alkyl group having 1 to 6 carbon atoms, a phenyl group, an alkoxy group, a hydroxy group, a halogen atom or a cyano group which high molecular weight compound is dissolved in an electrically insulating solvent (1) which dissolves more than about 4 wt. % of the high-molecular weight compound at room temperature and at atmospheric pressure to an organic solvent (2) in which the high-molecular weight compound is substantially insoluble, thereby depositing the high-molecular weight compound in a finely divided particle form, wherein an organic resin which is soluble in both of organic solvent (1) and organic solvent (2) in an amount of at least about 0.05 wt. % is dissolved in at least one of solution (A) and organic solvent (2), said developer being used as such as a wet developer.

4,120,806

HEXAGONAL-SYSTEM FERRITE POWDER, COMPOSITE PLASTIC-FERRITE MAGNET COMPRISING SAME AND PROCESS FOR PRODUCTION THEREOF

Yasuo Watanabe, and Seizi Isoyama, both of Okayama, Japan, assignors to Dowa Mining Co., Ltd., Tokyo, Japan

Division of Ser. No. 826,704, Aug. 22, 1977. This application Feb. 15, 1978, Ser. No. 878,022

Claims priority, application Japan, Aug. 30, 1976, 51-103356; Aug. 30, 1976, 51-103357

Int. Cl.[2] C04B *35/26*; H01F *1/117*

U.S. Cl. 252—62.54 **9 Claims**

1. A process for the production of a plastic-ferrite composite magnet which comprises: contacting a ferrous salt and a salt of Ba, Sr, Pb or Ca with an alkali in a liquid phase to form a co-precipitated product of $Fe(OH)_2$ and MCO_3, wherein M represents Ba, Sr, Pb or Ca, keeping the co-precipitated product thus obtained in the solution at a pH of from 9 to 12 and at a temperature of from 50° to 80° C., blowing air into the solution at a substantially constant rate to form fine bubbles for the purpose of oxidizing part of the $Fe(OH)_2$ formed in the solution to $Fe(OH)_3$, thereby converting a substantial part of the precipitated $Fe(OH)_2$ to Fe_3O_4 precipitate which has good filtering characteristics, is substantially free from alkalis and other co-existing ions and has a narrow distribution of grain size, calcining the co-precipitated product thus obtained at a temperature of from 400° to 900° C. to form a hexagonal-system ferrite powder; and kneading the hexagonal-system ferrite powder thus obtained with a thermoplastic resin.

4,120,807
PROCESS FOR PRODUCING HEXAGONAL-SYSTEM FERRITE POWDER

Yasuo Watanabe, and Seizi Isoyama, both of Okayama, Japan, assignors to Dowa Mining Co., Ltd., Tokyo, Japan

Filed Aug. 22, 1977, Ser. No. 826,704
Claims priority, application Japan, Aug. 30, 1976, 51-103356; Aug. 30, 1976, 51-103357
Int. Cl.[2] H01F 1/117
U.S. Cl. 252—62.62 7 Claims

1. A process for the production of a hexagonal-system ferrite powder which comprises two steps: (1) the first step comprising contacting a ferrous salt and a salt of Ba, Sr, Pb or Ca with alkali in a liquid phase to form therein a co-precipitated product of the $Fe(OH)_2$ and MCO_3, wherein M represents Ba, Sr, Pb or Ca; keeping the co-precipitated product thus obtained in the solutin at a pH of 9–12 and a temperature of 50°–80° C.; blowing air into the solution at a constant rate to form fine bubbles for the purpose of oxydizing part of the $Fe(OH)_2$ formed in the solution to $Fe(OH)_3$, thereby converting a substantial part of the precipitated $Fe(OH)_2$ to Fe_3O_4 precipitate which has good filtering characteristics, is substantially free from alkalis and other coexisting ions and has a narrow distribution of grain size; and (2) the second step in which the co-precipitated product obtained in the first step is subjected to calcination treatment which is carried out at a temperature in the range of 400°–900° C.

7. The hexagonal-system ferrite powder which is prepared by the process as defined in claim 1.

4,120,808
GAS DISCHARGE DIELECTRIC CONTAINING A SOURCE OF BORON, GALLIUM, INDIUM, OR THALLIUM

Bernard W. Byrum, Jr., Toledo; Roger E. Ernsthausen, Luckey, and Michael E. Fein, Toledo, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 205,276, Dec. 6, 1971, abandoned. This application Apr. 15, 1976, Ser. No. 677,599
The portion of the term of this patent subsequent to Jun. 7, 1994, has been disclaimed.
Int. Cl.[2] H01B 3/02
U.S. Cl. 252—63.2 9 Claims

1. As an article of manufacture, a dielectric material body for a gaseous discharge panel, said dielectric body having a gas contacting charge storage side surface and an electrode contacting side surface and containing a surface deposit of an oxide of at least one element selected from the group consisting of boron, gallium, indium, and thallium, said oxide deposit having a thickness of at least about 100 angstrom units to about 10,000 angstrom units.

4,120,809
WASHING AND BLEACHING WITH COMPOSITION CONTAINING BLEACH ACTIVATOR AND A NITRILOTRICARBOXYLIC ACID COMPOUND

Leo Thomas Murray, East Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 382,065, Jul. 24, 1973, Pat. No. 3,969,257, which is a continuation of Ser. No. 165,700, Jul. 23, 1971, abandoned, which is a continuation of Ser. No. 685,285, Nov. 24, 1967, abandoned. This application May 5, 1976, Ser. No. 683,601
The portion of the term of this patent subsequent to Jul. 13, 1990, has been disclaimed.
Int. Cl.[2] C11D 7/54
U.S. Cl. 252—102 15 Claims

1. A bleaching composition consisting essentially of (1) a stable, water-soluble inorganic peroxide bleaching agent, (2) an activator which is an acyl-containing compound capable of reaction with said peroxide in aqueous media whereby to form oxidizing species capable of providing bleaching activity and selected from the group consisting of

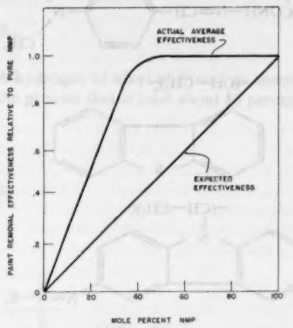
(a) trisacetyl cyanurate,
(b) phenyl acetate,
(c) acetylsalicyclic acid, and
(d) C1-4 alkyl and phenyl chloroformates, and

(3) a compound a nitrilotricarboxylic acid selected from the group consisting of nitrilotriacetic acid and water-soluble sodium, potassium and ammonium salts thereof, the nitrilotricarboxylic compound being present in an amount sufficient to improve the bleaching effectiveness of the composition, the activator-peroxide mol ratio being within the range of from about 0.01 to about 2.0 and the nitrilotricarboxylic compound-peroxide mol ratio being within the range of from 0.001 to 0.10.

4,120,810
PAINT REMOVER WITH IMPROVED SAFETY CHARACTERISTICS

David A. Palmer, 343 Hazelwood Dr., Naperville, Ill. 60540

Continuation-in-part of Ser. No. 512,896, Oct. 7, 1974, abandoned. This application Oct. 21, 1976, Ser. No. 734,656
Int. Cl.[2] C11D 3/44, 7/50
U.S. Cl. 252—153 6 Claims



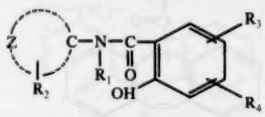
1. A paint, varnish, and general coatings remover or deglosser with improved safety characteristics consisting essentially of a mixture of at least two chemicals, the first chemical making up approximately 15 to 60 mole percent of the mixture and being one or more of the chemicals selected from the group consisting of n-methyl 2-pyrrolidone, n-vinyl 2-pyrrolidone, and butyrolactone; and the second chemical making up at least 35 mole percent of the mixture and comprising blends of alkyl naphthalenes and alkyl benzenes which have a molar volume greater than or equal to about 140 cc/g mole.

4,120,811
SAFE BLEACHING COMPOSITIONS FOR COLORED AND PATTERNED FABRICS

Kouichi Yagi, Tokyo, and Yunosuke Nakagawa, Koshigaya, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Aug. 10, 1977, Ser. No. 823,271
Claims priority, application Japan, Sep. 2, 1976, 51-105277
Int. Cl.[2] C11D 7/56, 7/18, 3/395; D06L 3/02
U.S. Cl. 252—186 10 Claims

1. A bleaching composition consisting essentially of from 50 to 99.9 percent by weight of inorganic peroxide capable of releasing hydrogen peroxide in aqueous solution, from 0.01 to 10 percent by weight of a compound having the formula (I):



(I)

wherein R_1 is hydrogen or alkyl having one to 3 carbon atoms,

is 5- or 6-membered heterocyclic radical which may have a fused ring; R_2 is hydrogen, alkyl having one to 10 carbon atoms, phenyl, pyridyl or pyrrolidone, which may optionally be substituted; R_3 is hydrogen, halogen, alkyl, phenyl, alkoxy, phenoxy, amino, acyloxy, carbamoyl or acyl which may optionally be substituted, or R_3 may form a benzo group together with R_4; R_4 is the same as R_3 or a monovalent radical having the formula $-R_5Y$ wherein R_5 is an alkylene or alkylidene group having 1 to 6 carbon atoms or phenylene, and Y is a radical formed by removing R_4 from a compound of the formula (1)

and the balance is essentially water-soluble inorganic builder, water-soluble organic builder or mixture thereof.

4,120,812

POLYETHYLENE GLYCOL-STABILIZED PEROXYGENS

Charles William Lutz, Princeton, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Jun. 17, 1977, Ser. No. 807,630
Int. Cl.[2] C11D *3/395, 7/54;* C01B *15/10*
U.S. Cl. 252—186 **3 Claims**

1. In a process in which a particulate peroxygen compound, selected from the group consisting of sodium carbonate peroxide, sodium perborate and mixtures thereof, is coated with a stabilizing agent, the improvement which comprises mixing the particulate peroxygen with about 0.1 to about 3.0 weight percent of a polyethylene glycol having an average molecular weight of from 300 to 1,500 and recovering a stabilized, polyethylene glycol-coated peroxygen compound.

4,120,813

HYGROSCOPIC RESIN AND HUMIDITY SENSOR USING THE SAME

Hideo Hatanaka; Yoshinobu Murakami, both of Katano, and Kazuhisa Morimoto, Settsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed May 16, 1977, Ser. No. 797,117
Int. Cl.[2] C09K *3/00*
U.S. Cl. 252—194 **4 Claims**

1. A humidity sensor comprising a hygroscopic resin, which resin comprises a vinyl polymer having epoxy group, said vinyl polymer being a copolymerization product of (a) a hydrophylic vinyl monomer selected from the group consisting of 2-hydroxyethyl acrylate and 2-hydroxyethyl methacrylate and (b) a further vinyl monomer having an epoxy group and being selected from the group consisting of glycidyl acrylate and glycidyl methacrylate, the amount of said further vinyl monomer being from 1 to 30 mole percent on the basis of the weight of said copolymerization product,

said hygroscopic resin having a electrically conductive powder dispersed therein, the amount of said electrically conductive powder being from 30 to 100 weight parts on the basis of 100 weight parts of said hygrosopic resin.

4,120,814

FLUOROPHOSPHATE-BASE LASER GLASSES

Tetsuro Izumitani, Hino, and Michitaka Tsutome, Akishima, both of Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Jul. 27, 1977, Ser. No. 819,440
Claims priority, application Japan, Feb. 28, 1977, 52/21081
Int. Cl.[2] C03C *3/16;* C09K *11/08*
U.S. Cl. 252—301.4 P **9 Claims**

1. A stable fluorophosphate-base laser glass having a non-linear refractive index coefficient of 0.5 to 0.7×10^{-13} e.s.u. and a liquid phase temperature of 550° to 750° C. consisting essentially of 5 to 25% $\frac{1}{2}P_2O_5$ and the remainder being a mixture of fluorides of the metals Al, Ba, Sr and Ca, and 0 to 25% fluorides of Na, K and Li and 0 to 5% of each of the fluorides of Y, La and Mg, and 0.01 to 3% of at least one laser oscillation component selected from the group consisting of $\frac{1}{2}Er_2O_3$, $\frac{1}{2}Eu_2O_3$ and $\frac{1}{2}Nd_2O_3$ incorporated into said glass, said percentages being cationic %, said glass not containing any glass forming component which would adversely affect laser oscillation efficiency thereof.

4,120,815

POLYMERIC DEMULSIFIERS

Manjeri S. Raman, Houston, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Oct. 25, 1977, Ser. No. 844,561
Int. Cl.[2] B01D *17/04*
U.S. Cl. 252—341 **1 Claim**

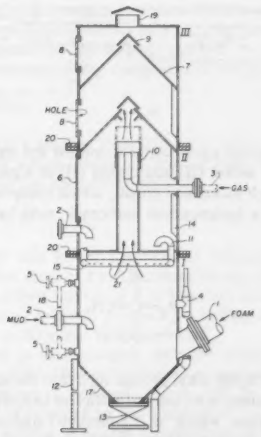
1. A method of breaking oil-in-water emulsions which comprise the steps of treating the emulsion with at least a demulsifying amount of a blend of about 50 weight percent of a cationic water-in-oil emulsion polymer which is prepared by the polymerization of a monomer mixture of 50 percent by weight acrylamide, 47.5 percent by weight diallyl dimethyl ammonium chloride, 2.5 percent by weight diallyl diethyl ammonium chloride and about 50 percent by weight of a water-in-oil amphoteric emulsion polymer which is prepared from a monomer mixture of 47.8 by weight acrylamide, 2.2 percent by weight acrylic acid, 47.5 percent by weight diallyl dimethyl ammonium chloride and 2.5 percent by weight diallyl diethyl ammonium chloride.

4,120,816

DEFOAMING APPARATUS

Jacques de Lautrec, and Jean-Francois Coste, both of Saint Gaudens, France, assignors to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

Filed Aug. 3, 1977, Ser. No. 821,512
Claims priority, application France, Aug. 6, 1976, 76 24069
Int. Cl.[2] B01D *19/00*
U.S. Cl. 252—361 **7 Claims**



1. A defoaming apparatus comprising a vertical cylindrical column having a lower level containing foam to be broken, an intermediate level, and an upper level; a frusto-conical bottom section into which said lower level communicates; conduit means for charging foam mixed with rubbish to said lower level; conduit means for charging mud to said lower level; valve means at the bottom of said bottom section to regulate

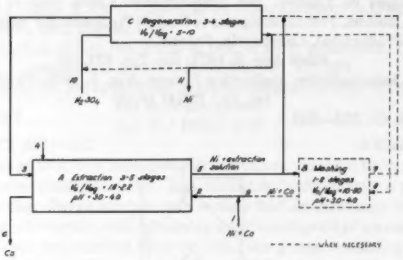
the discharge of sediment therefrom, at a rate controlled, in conjunction with the feeding of mud and foam, to maintain said lower level filled with mud and foam; means for injecting gas at low pressure and high flow into a vertical shaft of adjustable height located in said intermediate level and coaxial with said column, said shaft being open at each end, a plurality of superposed pairs of inclined vanes located in said upper level, and covered by a conical cap; whereby when gas is injected into said shaft a partial vacuum is created and the foam is drawn up into the shaft and discharged into said against said vanes; means for recovering liquid from the foam that breaks when driven against said vanes and spraying same over the surface of the foam in said lower level; and means for removing the gas released from said foam.

4,120,817

EXTRACTION AGENT COMPOSITION

Leif Erik Ingmar Hummelstedt; Bror Göran Nyman, both of Turku, and Raimo Juhani Leimala, Pori, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Continuation of Ser. No. 373,764, Jun. 26, 1973, abandoned. This application Sep. 29, 1975, Ser. No. 617,694
Claims priority, application Finland, Jul. 3, 1972, 1891/72
Int. Cl.[2] B01F *1/00*
U.S. Cl. 252—364 **5 Claims**



1. An extraction agent composition for the separation from each other of nickel (II) and cobalt (II) in aqueous solutions containing such nickel and cobalt, which composition consists essentially of a hydrocarbon carboxylic acid having the formula

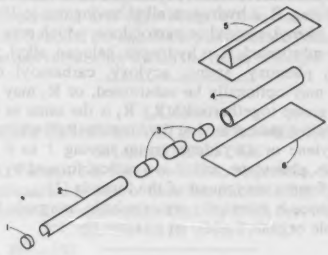
where R_1 and R_2 are alkyl groups such that the acid contains 9 to 11 carbon atoms in an amount sufficient to extract nickel and a hydroxy-oxime which is 5,8-diethyl-7-hydroxy-6-dodecyl oxime, 2-hydroxy-5-nonylbenzophenoxime, 2-hydroxy-3-chloro-5-nonylbenzophenoxime, or mixtures thereof, in a non-polar solvent, together with a small amount of dinonylnaphthalene sulphonic acid or 12–18 carbon atom-alkyl-substituted benzene sulphonic acid having a molecular weight of 330 to 390 sufficient to affect the phase interface tension and diminish the drop size of the dispersed phase and to accelerate the conversion of the material.

4,120,818

IRREVERSIBLE WARMUP INDICATOR

Frank E. Swindells, Arlington, Va., and Mary G. Klimas, Fort Pierce, Fla., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 10, 1976, Ser. No. 713,312
Int. Cl.[2] C09K *3/00*
U.S. Cl. 116—114 V **10 Claims**



1. An irreversible warmup indicator comprising:
a. gelatin capsule having a seam therein;
b. a strip of indicating paper-aluminum foil laminate covering one-half of the circumference of the capsule with the aluminum side of the laminate in contact with the capsule;
c. a sealed glass tube containing said capsule and said laminate;
d. a plastic outer casing containing said sealed glass tube;
e. a liquid placed in said capsule with a melting point which is equal to the temperature to be monitored, said liquid having a positive thermal expansion coefficient in the temperature range immediately above its freezing point, whereby the apparatus is activated by freezing the liquid and a subsequent temperature rise causes thawing of the liquid, which expands and escapes through the seam in the capsule and contacts the indicating paper; and
f. a dye, which is either dissolved in said liquid or is placed in powder form on said indicating paper.

4,120,819

METHOD FOR PLATINUM OR PALLADIUM CATALYST REACTIVATION

Robert James Small, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Sep. 15, 1977, Ser. No. 833,506
Int. Cl.[2] B01J *23/96, 21/20;* C07C *103/32*
U.S. Cl. 252—413 **5 Claims**

1. In a process for the reductive alkylation of an acid hydrazide wherein the hydrazide is reacted with formaldehyde in the presence of hydrogen and palladium or platinum catalyst supported on carbon; the improvement of regenerating said catalyst by recovering same from the reaction mixture, slurrying with a dilute aqueous solution of a lower monobasic carboxylic acid or a mineral acid, and thereupon intimately contacting said slurry with a free oxygen containing gas or a labile oxygen containing compound to restore the catalyst activity to essentially its initial level, and removing said regenerated catalyst from said slurry.

2. The improvement in accordance with claim 1 wherein said free oxygen containing gas is air.

3. The improvement in accordance with claim 2 wherein said acid is selected from the group consisting of formic, acetic, hydrochloric, sulfuric, nitric and phosphoric.

4,120,820

HIGH EFFICIENCY CATALYST FOR POLYMERIZING OLEFINS

Donald F. Birkelbach, Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 1, 1976, Ser. No. 746,354
Int. Cl.[2] C08F *4/64*
U.S. Cl. 252—429 B 7 Claims

1. A catalytic reaction product of (A) a complex of a trivalent titanium halide with water or an organic electron donor selected from alcohols having 2–8 carbon atoms, ethers having 2 to 20 carbon atoms, ketones having 3–20 carbon atoms, amines having 1–20 carbon atoms, olefins having 2–20 carbon atoms and mixtures thereof, (B) an organomagnesium component selected from (1) an organomagnesium compound or (2) a complex of an organomagnesium compound and an organometallic compound in an amount sufficient to solubilize the organomagnesium compound in hydrocarbon, said organomagnesium compound and said complex being represented respectively by the following formulas

$$MgR_2 \text{ and } MgR_2 \times MR_y$$

wherein each R_2 is independently a hydrocarbyl group having from 1 to 8 carbon atoms, M is a metal selected from Al, Zn, Si, Sn and P, y is the number of hydrocarbyl groups and corresponds to the valencey of M and x is about 0.001 to 10 and (C) a halide source selected from (1) an active non-metallic halide, said non-metallic halide corresponding to the formula R'X wherein R' is hydrogen or an organic group at least as active as sec-butyl and does not poison the catalyst and X is halen or (2) a metallic halide corresponding to the formula $MR_{y-a}X_a$ wherein M is a metal of Group 3*a* or 4*a* of Mendeleev's Periodic Table of Elements, R is a monovalent organic radical, X is halogen, y is a number corresponding to the valence of M and a is a number from 1 to y; provided that the proportions of the foregoing components of said catalytic reaction product being such that the atomic ratio of Mg:Ti is within the range which is from about 1:1 to about 2000:1, either B, C or a mixture thereof contains aluminum or an aluminum trialkyl or an aluminum alkyl halide is added separately such that the atomic ratio of Al:Ti is within the range from about 0.1:1 to about 2000:1, the atomic ratio of Mg:X is within the range from about 0.01:1 to about 1:1.

4,120,821

CATALYST FOR CONVERSION OF ENGINE EXHAUST GAS

Akio Iizuka; Michiichi Taguchi, both of Yokohama, and Muneyuki Kubo, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Aug. 12, 1976, Ser. No. 713,788
Claims priority, application Japan, Aug. 28, 1975, 50-103415
Int. Cl.[2] B01J *21/02, 23/56, 8/02*
U.S. Cl. 252—432 15 Claims

1. A catalyst for simultaneous oxidation of hydrocarbons and carbon monoxide and reduction of nitrogen oxides in exhaust gas of an internal combustion engine, consisting essentially of a carrier which is made of active alumina at least in a surface portion thereof, 0.05–0.2 Wt% of the carrier of platinum, 0.0015–0.045 Wt% of the carrier of rhodium and 0.002–5 Wt% of the carrier of boron said catalyst being produced by impregnating said carrier with three thermally decomposable compounds of, respectively, platinum, rhodium and boron and then baking the impregnated carrier at temperatures not higher than 650° C.

4,120,822

CATALYTICALLY ACTIVE COMPOSITION FOR ELECTROLESS PLATING

Melvin Neil Jameson, St. M... ys; James Donald Klicker, Morgantown; Gerald Albert Krulik, Washington, and James Farnsworth York, Morgantown, all of W. Va., assignors to McGean Chemical Co., Cleveland, Ohio

Continuation of Ser. No. 652,002, Jan. 26, 1976, abandoned. This application May 11, 1977, Ser. No. 795,836
Int. Cl.[2] B01J *27/06;* C23C *3/00*
U.S. Cl. 252—441 6 Claims

1. A method of preparing a catalytically active concentrate free from extrinsic sources of acid comprising the steps of:
(1) melting a predetermined quantity of a hydrated stannous chloride composition;
(2) adding an aqueous solution of palladium chloride and a water soluble halide salt, other than said stannous chloride composition and said palladium chloride, selected from the group consisting of bromide and chloride to the molten hydrated stannous chloride;
(3) adding anhydrous stannous chloride to the mixture in a quantity sufficient to convert, at a minimum, all but 20% of the water in said aqueous solution to water of hydration associated with said anhydrous stannous chloride;
(4) reacting the mixture at a temperature between 35° and 140° C; and
(5) cooling the product to yield a dry, friable material or a liquid or a semisolid concentrate.

4,120,823

MANUFACTURE OF A TITANIUM-CONTAINING COMPONENT FOR CATALYSTS OF THE ZIEGLER-NATTA TYPE

Heinz Mueller-Tamm, Ludwigshafen; Hans Schick, Mannheim; James F. R. Jaggard, Ludwigshafen, and Johann Nickl, Bad Durkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 30, 1977, Ser. No. 855,874
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1976, 2658937
Int. Cl.[2] C01G *23/02*
U.S. Cl. 252—442 14 Claims

1. A process for the manufacture of a titanium-containing component of a catalyst for the homopolymerization and copolymerization of α-monoolefins of 3 to 6 carbon atoms by the Ziegler-Natta method, by milling together
(a) a titanium-containing compound of the general formula

$$TiCl_3 . nAlCl_3$$

where n is a number from 0.01 to 1, and
(b) an ether which contains a total of from 4 to 30 carbon atoms and has the general formula

$$R^1 - O - R^2$$

where R^1 and R^2 are identical or different and each is open-chain alkyl of 1 to 15 carbon atoms, phenyl or alkylphenyl, where alkyl is of 1 to 8 carbon atoms, wherein
(1) a vibratory ball mill producing a milling acceleration of from 30 to 80 m.sec.$^{-2}$ is employed,
(2) the mill is first charged with the titanium-containing compound (a), after which it may or may not be operated in the absence of a diluent at from −50° to +100° C. over a period of from 0.5 to 100 hours, then
(3) whilst milling at a grist temperature of from −50° to +80° C., an amount of the ether (b) which corresponds to a molar ratio of aluminum in the titanium-containing compound (a) to ether (b) of from 1:5 to 1:0.5 to 1:0.05 is added continuously or at intervals, in the absence of a diluent, at a rate of from 0.01 to 200 ml/min per 2.5 kg of titanium-containing compound (a), thereafter
(4) whilst being milled, the grist is brought to from −10° to +100° C. and is kept in this temperature range until from

6 to 85% of the aluminum trichloride originally present in a bonded form in the titanium-containing compound (a) has been eliminated from the latter, after which

(5) the product obtained in accordance with (4) is washed with at least 0.6 **times its amount by weight of a hydrocarbon which is liquid at standard temperature and pressure and boils below** 150° C. at standard pressure, then

(6) the product obtained in accordance with (5) is dried and milled, in the absence of diluents, for a period of from 5 to 60 minutes at from −50 ° to +10° C., subsequently

(7) the product obtained in accordance with (6) is suspended in from 0.5 to 60 times its amount by weight of a hydrocarbon which is liquid at standard temperature and pressure and boils below 150° C. at standard pressure, thereafter

(8) the suspension obtained in accordance with (7) is mixed with the ether (b) in such amount that a molar ratio of titanium from the titanium-containing compound (a) to ether (b) of from 1:0.5 to 1:5 results and the batch is agitated vigorously for a period of at least 5 minutes at from 0° to 90° C., thereupon

(9) the solid is isolated from the suspension obtained in accordance with (8) and is washed with at least an equal amount by weight of a hydrocarbon which is liquid at standard temperature and pressure and boils below 150° C. at standard pressure, and thereupon

(10) the product obtained in accordance with (9) is dried and milled, in the absence of diluents, for a period of from 5 to 60 minutes at from −50° to +10° C.

4,120,824

TETRAVALENT MANGANESE-CARBON OXIDATION CATALYSTS AND METHODS OF THEIR PREPARATION

Walter M. Kruse, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Filed Apr. 18, 1977, Ser. No. 788,138

Int. Cl.[2] **B01J** *21/18, 23/34;* **C08G** *61/10;* **C07C** *37/00*

U.S. Cl. 252—447 **7 Claims**

1. A heterogeneous oxidation catalyst consisting essentially of about 1 to 10% by weight of tetravalent manganese precipitated on porous carbon which is substantially free of mineral impurities.

3. A method of preparing a catalyst as claimed in claim 1 which comprises slurry a aqueous solution of a permanganate salt with a porous carbon substantially free of mineral impurities and subsequent thereto drying the slurry at temperatures of below 25° C. to obtain a solid catalyst.

6. A method as claimed in claim 3 wherein the drying is accomplished by vacuum drying.

7. A method as claimed in claim 3 wherein the drying is accomplished by freeze drying.

4,120,825

HYDROGENATIVE CONVERSION CATALYST

John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 244,947, Apr. 17, 1972, Pat. No. 3,835,027. This application Jan. 25, 1974, Ser. No. 436,605

Int. Cl.[2] **B01J** *29/06*

U.S. Cl. 252—455 Z **7 Claims**

1. The composition including an amorphous refractory oxide component consisting essentially of at least one of alumina, titania, zirconia and silica-magnesia, a catalytically active amount of at least one crystalline zeolitic aluminosilicate and a hydrogenation component comprising at least one of the metals, oxides and sulfides of Periodic Groups VIB and VIII having improved hydrocarbon conversion characteristics prepared by: intimately admixing a finely divided form of said refractory oxide component previously thermally activated at a temperature of at least about 600° F. with said aluminosilicate in finely divided form and forming an aggregate of the combination of said activated refractory oxide, zeolitic aluminosilicate and hydrogenation component, and thermally activating said aggregate at a temperature above 600° F.

4,120,826

HYDRODESULFURIZATION CATALYSTS BASED ON SUPPORTS PREPARED FROM REHYDRATABLE ALUMINA

Robert H. Ebel; Donald P. Spitzer, both of Riverside, and William Edward Bambrick, Old Greenwich, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 14, 1976, Ser. No. 696,092

Int. Cl.[2] **B01J** *21/04, 23/84, 23/88*

U.S. Cl. 252—465 **12 Claims**

1. A method of preparing hydrotreating catalysts for catalytic hydrodesulfurization of petroleum, having activated alumina supports, comprising:

preparing a partially dehydrated, rehydratable alumina by flash calcining Bayer process hydrated alumina;

rehydrating said partially dehydrated alumina with water which contains acid at pH below 7 at rehydration temperature, for the time needed for rehydration;

solidifying the rehydrated alumina;

mulling the solidified rehydrated alumina with sufficient water to make a mulled mixture suitable for particle forming; forming particles of desired size and configuration from the mulled mixture;

drying the formed alumina particles and then calcining same by heating to calcining temperature;

impregnating the calcined particles with liquid solutions of soluble compounds which are thermally decomposable to oxides of cobalt or nickel and to oxides of molybdenum or tungsten; and

activating the impregnated alumina particles by calcining heat treatment to form hydrotreating catalysts.

4,120,827

FUEL IGNITER COMPRISING A NOVEL SILICON CARBIDE COMPOSITION AND PROCESS FOR PREPARING THE COMPOSITION

Charles John Boos, Lewiston; Elwood Benjamin Hausler, Grand Island; James Arthur Hirsch, Niagara Falls; Martin Richard Kasprzyk, Buffalo, and Elmer Gene Smith, Niagara Falls, all of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Mar. 12, 1976, Ser. No. 666,297

Int. Cl.[2] **H01B** *1/02*

U.S. Cl. 252—512 **35 Claims**

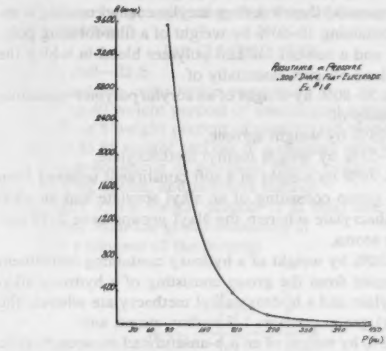
1. A composition comprising particulate silicon carbide having an average particle size of less than about 20 microns pressed at a temperature of from about 1800° to about 2400° C. at a pressure of from about 70 to about 750 kilograms per square centimeter for a sufficient time to obtain a density above about 2.5 grams per cubic centimeter, said composition further comprising at least 95.0 weight percent silicon carbide containing from about 0.005 to about 0.05 moles per 100 grams of composition of at least one dissolved negative doping element, said at least one negative doping element being in sufficient mole excess of the total moles of all positive doping elements present in said composition to provide sufficient negative doping to said composition to reduce the cold volume resistivity to less than about 1.25 ohm cms and to reduce the ratio of cold volume resistivity at 20° C. to hot volume resistivity at 1200° C. of less than about 12 to 1.

4,120,828

PRESSURE SENSITIVE RESISTANCE AND PROCESS OF MAKING SAME

Michael Michalchik, Newport Beach, Calif., assignor to Dynacon Industries, Inc., West Milford, N.J.

Filed Aug. 15, 1977, Ser. No. 824,298
Int. Cl.[2] H01B *1/02*
U.S. Cl. 252—513 7 Claims



1. As an article of manufacture, finely divided metallic particles, each having a coating of deformable, electrically semiconducting compound thereon.

4,120,829

ELECTRICALLY SEMI-CONDUCTING CERAMIC BODY

Francis H. Dulin, Oakland Township, Oakland County, Mich., assignor to Champion Spark Plug Company, Toledo, Ohio

Continuation-in-part of Ser. No. 321,563, Jan. 8, 1973, abandoned. This application Mar. 31, 1976, Ser. No. 672,153
Int. Cl.[2] H01B *1/04*
U.S. Cl. 252—516 2 Claims

1. A fired, electrically semi-conducting ceramic body having an apparent porosity from 20 to 40 and improved resistance to erosion, and consisting essentially of silicon carbide particles having a median particle size from about 3 to about 25 microns dispersed in a bonding matrix, said silicon carbide particles constituting from about 50 to about 70 percent of the body.

4,120,830

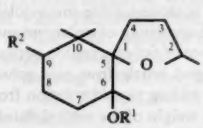
USE OF SPIRANE DERIVATIVES TO IMPROVE PERFUME COMPOSITIONS

Walter Renold, Onex; Werner Skorianetz, Geneva; Karl-Heinrich Schulte-Elte, Onex, and Günther Ohloff, Bernex, all of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

Continuation-in-part of Ser. No. 625,452, Oct. 23, 1975, Pat. No. 4,014,905, which is a continuation-in-part of Ser. No. 542,072, Jan. 17, 1975, abandoned. This application Oct. 1, 1976, Ser. No. 728,644
Int. Cl.[2] C11B *9/00*
U.S. Cl. 252—522 10 Claims

1. A process for improving, enhancing or modifying the organoleptic properties of perfumes which comprises adding thereto a spirane derivative of formula

(II)



wherein the symbol R^1 represents a hydrogen atom or an alkanoyl radical containing from 1 to 6 carbon atoms and R^2 represents a hydrogen atom or a methyl radical.

4,120,831

PROCESS FOR PRODUCING CARBOXYL CATIONITES

Nadezhda Nikolaevna Kuznetsova, Bolshoi prospekt, 11, kv. 7; Georgy Vasilievich Samsonov, 10 linia, 9, kv. 5; Klavdia Pavlovna Papukova, ulitsa Korablestroitelei, 19, korpus 1, kv.702; Galina Vladimirovna Bilibina, 7 linia, 2, kv. 33; Larisa Konstantinovna Shataeva, 3 Sovetskaya ulitsa, 9, kv. 22; Aida Alexandrovna Selezneva, prospekt Metallistov, 80, korpus 1, kv. 77; Nina Petrovna Kuznetsova, ulitsa Ostroumova, 7/9, kv. 13, all of Leningrad; Oyar Ansovich Vitols, ulitsa Lenina 11, kv. 40, Rizhsky raion, Olaine; Anite Ansovna Shtrausa, ulitsa Revoljutsii, 87, kv. 1, Riga; Lev Romanovich Gudkin, ulitsa Korablestroitelei, 23, korpus 1, kv. 279, Leningrad; Rimma Nikodimovna Mishaeva, naberezhnaya reki Karpovki, 13, kv. 27, Leningrad, and Karina Moiseevna Rozhetskaya, ulitsa Podvopnika Kuzmina, 50, kv. 36, Leningrad, all of U.S.S.R.

Filed Jun. 2, 1977, Ser. No. 802,629
Int. Cl.[2] C08J *5/20;* C08F *4/40, 20/70*
U.S. Cl. 521—38 5 Claims

1. A process for producing carboxyl cationites comprising dissolution of an unsaturated carboxylic acid and a vinyl-containing amide as comonomers and an initiator of radical polymerization in a 5–50% acetic acid; as the unsaturated carboxylic acids use is made of compounds selected from the group consisting of methacrylic and acrylic acids; as the vinyl-containing amides use is made of compounds selected from the group consisting of hexahydro-1,3,5-triacryloyltriazine, N,N′-methylenediacrylamide, N,N′-ethylenedimethacrylamide and N,N′-hexamethylenedimethacrylamide; the unsaturated carboxylic acid and vinyl-containing amide are taken in a weight ratio of 3–12:1 at a concentration of said comonomers in a 5–50% acetic acid equal to 10–30%; the resulting reaction mixture is dispersed in a silicone liquid selected from the group consisting of polyethylsiloxane and polymethylphenylsiloxane liquids; weight ratio of said reaction mixture to said silicone liquid is 1:3–5 respectively; copolymerization is then effected in suspension at a temperature of from 20° to 100° C.

4,120,832

PROCESS FOR THE PREPARATION OF A COATING COMPOSITION FOR ROADS, AIRPORTS AND INDUSTRIAL FLOORINGS

Marcel Ceintrey, Marly Le Roi, France, assignor to Screg Routes et Travaux Publics, Paris, France

Filed Oct. 30, 1975, Ser. No. 627,471
Claims priority, application France, Nov. 8, 1974, 74 37158
The portion of the term of this patent subsequent to Apr. 27, 1993, has been disclaimed.
Int. Cl.[2] C08J *11/04;* C08L *27/06, 95/00*
U.S. Cl. 260—2.3 4 Claims

1. Process for preparation of a coating composition useful for roads, airports, industrial floorings, canals and dams, comprising inorganic granulates coated with 4–12 wt%, by weight of the granulates, of a 25°–60° EVT coal tar pitch, and with 5–30 wt%, by weight of the coal pitch, of ground waste plastic materials selected from the group consisting of waste polyvinyl chloride packaging material, waste polyvinyl chloride material used for the production of bottles and flasks, waste polyvinyl chloride material with added impact-resistant styrene-butadiene-acrylonitrile resin material and polyvinyl chloride waste material containing up to 10 wt% waste polyethylene, and having a particle size of less than 10 mm, comprising admixing pre-ground waste plastic materials with inorganic granulates heated at a temperature of 120°–150° C. and below the decomposition temperature of said plastic materials, during a period of time of less than 30 seconds, then adding the pitch heated at a temperature of about 120° C. to about 140° C., and mixing said ingredients during a period of time sufficient to

initiate the plasticizing of the waste material and coat the granulates.

4,120,833

MODIFIERS FOR PVC FOAM, PROCESS FOR EXTRUDING MODIFIED PVC FOAM AND MODIFIED PVC FOAM COMPOSITIONS

Marshall T. Purvis, and R. Peter Grant, both of Newtown, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 453,627, Mar. 22, 1974, Pat. No. 3,983,296. This application Jun. 14, 1976, Ser. No. 695,608

Int. Cl.[2] C08J *9/06;* **C08L** *27/06, 33/08, 49/00*

U.S. Cl. 921—81 **21 Claims**

1. A modifier system for extruding polyvinyl chloride foam comprising:

a first core shell polymer having a hard shell polymerized from a shell-forming monomer system comprised of, in major part, at least one C_1 to C_4 alkyl methacrylate, having a molecular weight ($\overline{M}_v$) above 1.5 million, polymerized in the presence of, but less than about 20% grafted to, a crosslinked core polymerized from a core-forming monomer system comprised of, in major part, C_2 to C_8 alkyl acrylate, and about 0.1 to 5 weight percent, based on C_2 to C_8 alkyl acrylate, of a glycol dimethacrylate crosslinking agent, the weight ratio of shell to core being about 40:60 to 75:25; and

a second core-shell polymer having a shell polymer having an average molecular weight ($\overline{M}_v$) of at least about 450,000 polymerized from a shell-forming monomer system comprised of, in major part, at least one C_1 to C_4 alkyl methacrylate, and polymerized in the presence of, but less than about 20% grafted to, a core polymer having an average molecular weight ($\overline{M}_v$) of at least about 5,000 up to about 100,000 polymerized from a monomer or monomer mixture comprising, in major part, at least one C_1 to C_8 alkyl acrylate, the weight ratio of shell to core being about 60:40 to 0:100,

wherein the weight ratio of the first core-shell polymer to the second core-shell polymer is about 20:1 to about 2:1.

21. A formable composition comprising 100 parts by weight polyvinyl chloride or copolymers of vinyl chloride containing up to 20% by weight of other monovinylidene compounds, about 1 to 25 parts by weight of the modifier system of claim **1**, and about 0.1 to 5 parts by weight of a blowing agent, said composition being extrudable and, when extruded, being highly processable with improved resistance to thermal decomposition.

4,120,834

MODIFIED POLYOLS

Pierluigi Fatutto, Mestre (Venice), Italy, assignor to Montedison S.p.A., Milan, Italy

Filed Jul. 6, 1977, Ser. No. 813,417

Claims priority, application Italy, Jul. 9, 1976, 25181 A/76

Int. Cl.[2] C08J *9/00*

U.S. Cl. 521—164 **8 Claims**

1. Modified polyols consisting of the reaction product of diols having an equivalent weight ranging from 30 to 150, with polyisocyanates having an equivalent weight ranging from 50 to 200, characterized in that said modified polyols exhibit a diol/isocyanate weight ratio comprised between 10 and 1 and an OH/NCO equivalent ratio comprised between 3 and 50.

8. Formulations for polyurethane foams containing, as polyol-polyether components, one or more of the modified polyols according to claim **1**.

4,120,835

THERMOSETTING ACRYLIC ENAMEL CONTAINING IRON PYROPHOSPHATE

Carol Eve Goodell, Rochester, Mich., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 692,501, Jun. 3, 1976, abandoned. This application Feb. 16, 1978, Ser. No. 878,653

Int. Cl.[2] C08L *1/14*

U.S. Cl. 260—15 **8 Claims**

1. An improved thermosetting acrylic enamel coating composition containing 10–60% by weight of a film-forming polymer blend and a solvent for said polymer blend in which the polymer blend consists essentially of

(a) about 50–80% by weight of an acrylic polymer consisting essentially of

(1) 0–25% by weight styrene,

(2) 25–55% by weight methyl methacrylate,

(3) 38–48% by weight of a soft constituent selected from the group consisting of an alkyl acrylate and an alkyl methacrylate wherein the alkyl groups have 2–12 carbon atoms,

(4) 5–20% by weight of a hydroxy containing constituent selected from the group consisting of a hydroxy alkyl acrylate and a hydroxy alkyl methacrylate wherein the alkyl group contains 1–8 carbon atoms, and

(5) 1–5% by weight of an α,b-unsaturated monocarboxylic acid;

(b) about 5–50% by weight of cellulose acetate butyrate having a viscosity of 1–6 seconds; and

(c) about 5–50% by weight of melamine formaldehyde resin at least partially alkylated with an aliphatic monohydric alcohol;

wherein the improvement used in combination therewith comprises:

0.1–5% by weight based on the weight of the polymer blend, of iron pyrophosphate powder.

4,120,836

PROCESS FOR PREPARING SHAPED CELLULOSE ACETATE ARTICLE

Andrew B. Auerbach, Livingston; John P. Thelman, Kenvil, and Albin F. Turbak, Convent Station, all of N.J., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sep. 14, 1977, Ser. No. 833,076

Int. Cl.[2] C08L *1/12*

U.S. Cl. 260—15 **6 Claims**

1. In a process for preparing a cellulose acetate shaped article comprising mixing a solution of cellulose diacetate containing free hydroxyl groups with an acetone solvent, said solution containing an acetone-soluble methylolated polymer selected from the group consisting of melamine and quanamine polymers having a degree of polymerization between 2 and 10, and regenerating a shaped article from said solution, the improvement comprising adding to said solution from 1 to 20% by weight based on the weight of the methylolated polymer of a cyclic area compound selected from the group consisting of ethylene urea and hydrocarbon substituted ethylene ureas.

4,120,837

ORGANOSILOXANES USEFUL IN MOLDING COMPOSITIONS BASED ON UNSATURATED POLYESTERS AND UNSATURATED MONOMERS

Werner Schäfer, Diedenbergen; Hans-Albrecht Scholz, Hochheim, and Siegfried Wilhelm, Wiesbaden, all of Germany, assignors to Rutgerswerke Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 9, 1977, Ser. No. 794,996

Claims priority, application Fed. Rep. of Germany, May 15, 1976, 2621740

Int. Cl.[2] **C08L** *67/06*

U.S. Cl. 260—22 S **38 Claims**

1. A molding composition comprising

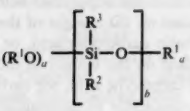
(i) 12 to 40 weight percent of unsaturated polyester resins,

(ii) 0.5 to 5 weight percent of unsaturated monomers,

(iii) 30 to 85 weight percent of a member selected from the group consisting of inorganic fillers, organic fillers, reinforcing agents, and mixtures thereof,

(iv) 0.01 to 1.0 weight percent of at least one siloxane selected from the group consisting of

(A) a siloxane of the formula



wherein

a is 0 or 1,

b is a number from 1 to 500, provided that when a is 0, b is equal to or greater than 3 and the compound is a cyclosiloxane,

R^1 is a member selected from the group consisting of hydrogen, alkyl and trimethylsilyl,

R^2 is a member selected from the group consisting of alkyl of 8 to 32 carbon atoms,

and $—R^4OR^6$, where R^4 is a divalent radical, R^5 is alkyl of 12 to 22 carbon atoms and R^6 is alkyl of 8 to 22 carbon atoms, provided that up to 80 mole % of the above-mentioned radicals may be replaced by methyl and provided further that at least one R^2 group per molecule is other than methyl, and

R^3 is methyl or alkoxy of 1 to 4 carbon atoms,

(B) a carboxyorganosiloxane which corresponds in structure to that of a linear methyl silicone having a continuous Si—O—Si— chain wherein a large portion of the alkyl groups are replaced by ester groupings prepared by esterification with an alcohol having from 1 to 4 carbon atoms, and

(C) a mixture of the above siloxanes, said siloxane or mixture of siloxanes acting as an external and/or internal lubricant, and

(v) the remainder catalysts and a member selected from the group consisting of dyestuffs, pigments and mixtures thereof in conventional amounts.

4,120,838

POLYPHOSPHAZENE WIRE COVERINGS

John Charles Vicic, Painesville, Ohio, and Kennard Anthony Reynard, Adrian, Mich., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Aug. 1, 1977, Ser. No. 821,018

Int. Cl.[2] **C08L** *85/02, 43/02*

U.S. Cl. 260—29.1 SB **9 Claims**

1. A composition suitable as a fire resistant low smoking, electrically insulating covering for electrically conducting metal wires comprising for each 100 parts by weight of polyaryloxyphosphazene polymer:

(1) between 50 and 125 parts by weight of a hydrated filler selected from the group consisting of $Mg(OH)_2$, $Al_2O_3.3H_2O$ and mixtures thereof;

(2) an effective amount of a curing agent;

(3) between 3 and 11 parts by weight of a polysiloxane as a processing agent; and

a compound of lead in an amount which is effective to improve the moisture resistance of the composition.

4,120,839

OLIGOMERIC AMINO-CONTAINING AMINOLYSIS PRODUCTS OF POLYMETHACRYLATES OR POLYACRYLATES, AND EPOXY RESIN COATING COMPOSITIONS CONTAINING SUCH AMINOLYSIS PRODUCTS AS CURING AGENTS

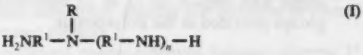
William D. Emmons, Huntingdon Valley, and Travis E. Stevens, Ambler, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jan. 13, 1977, Ser. No. 758,894

Int. Cl.[2] **C08F** *8/32;* **C08L** *23/36, 63/00*

U.S. Cl. 260—29.2 EP **18 Claims**

1. A solid product of aminolysis by an alkylene polyamine of the formula:



(I)

wherein

R^1 is an alkylene group having 2 to 6 carbon atoms,

R is H or R^1NH_2, and

n is 0 or an integer from 1 to 4, of an alkyl methacrylate ester oligomer having a number average molecular weight from about 600 to 10,000, selected from the group consisting of:

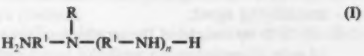
(1) homopolymers of a (C_1–C_4) alkyl methacrylate and

(2) copolymers exclusively of at least two alkyl methacrylates in which a (C_1–C_4) alkyl methacrylate is the major component,

the product having N-amino-substituted methacrylamide units of the formula:

wherein R^1, R, and n are as defined hereinabove, in the oligomer chain.

5. A coating composition having a binder consisting essentially of (a) a product of aminolysis by an alkylene polyamine of the formula



(I)

wherein

R^1 is an alkylene group having 2 to 6 carbon atoms,

R is H or R^1NH_2, and

n is 0 or an integer from 1 to 4, of a vinyl oligomer having a number average molecular weight from about 600 to about 10,000 selected from the group consisting of

(1) homopolymers of a (C_1–C_4) alkyl methacrylate,

(2) copolymers of at least two alkyl methacrylates in which a (C_1–C_4) alkyl methacrylate is the major component,

(3) homopolymers of a (C_1–C_4) alkyl acrylate,

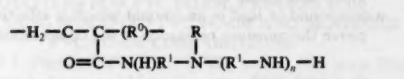
(4) copolymers exclusively of at least two alkyl acrylates in which a (C_1–C_4) alkyl acrylate is the major component,

(5) copolymers of an alkyl acrlate with an alkyl methacrylate containing at least 35 mole percent of at least one (C_1–C_6) alkyl acrylate or methacrylate, and

(6) copolymers of (a) at least one monomer selected from

alkyl acrylates and alkyl methacrylates with (b) at least one monomer selected from acrylic acid, methacrylic acid, styrene, and vinyltoluene, such copolymers containing at least 35 mole percent of at least one (C_1–C_6) alkyl acrylate or methacrylate,

the product having N-amine-substituted amide units of the formula



wherein

R_0 is H or CH_3,

R^1 is an alkylene group having 2 to 6 carbon atoms, and

R is H or R^1NH_2, and

n is 0 or an integer from 1 to 4 and also having carboxylic units selected from methacrylic acid and acrylic acid units in the oligomer chain, the product having 0.5 to 10 milliequivalents of amine per gram and 0.25 to 5 milliequivalents of carboxylic acid per gram, at least some of the carboxylic acid units being in the form of an internal salt of amine groups on the amide units and (b) a resin-forming polyepoxide, the proportion of aminolysis product used in the composition providing from 25 to 75 equivalents of amine with respect to 75 to 25 equivalents of epoxide groups provided in the polyepoxide.

4,120,840

PHOSPHORUS ACID TO STABILIZE QUATERNIZED POLYACRYLAMIDE

John R. Hurlock, Hickory Hills, and Edward G. Ballweber, Glenwood, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Jan. 28, 1977, Ser. No. 763,477

Int. Cl.[2] C08L *61/20*

U.S. Cl. 260—29.4 UA **7 Claims**

1. A method for the stabilization of water-in-oil emulsions of finely divided water-soluble quaternary salts of poly trimethylamino methylol acrylamide of the type comprising:

A. 5–70% by weight of the emulsion of a hydrophobic liquid;

B. 0.1–21% by weight of the emulsion of a water-in-oil emulsifying agent;

C. 10–50% by weight of the emulsion of the quaternary salt of poly trimethylamino methylol acrylamide; and,

D. 30–95% by weight of the emulsion of an aqueous phase consisting of the polymer and water;

said polymer further characterized as having a particle size of from 0.1 microns to 10 microns within the emulsion; the method which comprises:

E. Adding with mixing to said water-in-oil emulsion from 5–80 mole percent of orthophosphorus acid based on the quaternary salt of poly trimethylamino methylol acrylamide present in said emulsion so as to adjust the pH of said emulsion to a level of from 3.0–5.5;

F. Heating the resultant water-in-oil emulsion to a temperature of from about 60°–90° C. for about 2–20 hours; and then,

G. Recovering a stabilized water-in-oil emulsion of the quaternary salt of poly trimethylamino methylol acrylamide.

4,120,841

LEVELLING AGENT FOR AQUEOUS PAINTS

Hiroshi Takahashi, Nishinomiya; Seizaburo Hirai, Takatsuki, and Toshio Abo, Ibaraki, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 678,900, Apr. 21, 1976, abandoned. This application Jun. 10, 1977, Ser. No. 805,436

Claims priority, application Japan, Apr. 21, 1975, 50-48990

Int. Cl.[2] C08L *23/26, 23/36*

U.S. Cl. 260—29.6 H **13 Claims**

1. A method for imparting to an aqueous paint composition the ability to substantially avoid cissing of, and formation of craters in, coatings of the composition applied to a substrate, which comprises incorporating in the composition a copolymer of a monoethylenically, alpha, beta-unsaturated monobasic or dibasic carboxylic acid and an alkyl acrylate or alkyl methacrylate having in each case from 1 to 18 carbon atoms in the alkyl moiety, in an amount of from about 0.1 to 4% by weight based on the weight of the composition, the copolymer having an average molecular weight of from about 2,000 to 80,000 when determined by gel permeation chromatography, and an acid value of from about 30 to 200, the content of the carboxylic acid units in the copolymer being from about 5 to 40% by weight based on the weight of the copolymer in the case of the monobasic carboxylic acid, or from about 2.5 to 20% by weight based on the weight of the copolymer in the case of the dibasic carboxylic acid, the carboxyl groups of the copolymer being completely or substantially completely neutralized with a base.

4,120,842

SAND CONSOLIDATION COMPOSITION

Bobby G. Harnsberger, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Division of Ser. No. 753,760, Dec. 23, 1976. This application Sep. 19, 1977, Ser. No. 834,099

Int. Cl.[2] B22C *1/22;* C08K *5/01;* E21B *33/13*

U.S. Cl. 260—33.6 UA **10 Claims**

1. A treating composition for use in forming a fluid permeable barrier film in a sand containing, unconsolidated oil producing formation which consists essentially of, on a volume basis, 10 to 25% of furfuryl alcohol, 1 to 4% of a nonionic dispersing surfactant, 1 to 4% of water, 0.5 to 1.5% of a silane bonding agent, 1 to 5% of a polymerization catalyst for said furfuryl alcohol, 5 to 15% of a low-in-aromatics (about 20% maximum) petroleum distillate fraction, and from about 47 to about 76% of a high-in-aromatics (above about 80%) petroleum fraction.

4,120,843

STRIPPABLE SOLDER MASK MATERIAL COMPRISING POLYSULFONE, SILICON DIOXIDE FILLER, AND SOLVENT

Joseph G. Ameen, Apalachin; Glenn V. Elmore, Vestal, and Anthony E. Peter, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 671,898, Mar. 29, 1976, abandoned. This application Apr. 10, 1978, Ser. No. 894,673

Int. Cl.[2] B23K *35/22;* C08G *75/20*

U.S. Cl. 260—33.8 R **4 Claims**

1. A solder mask material operative to protect gold thermocompression bonding sites on a ceramic module during a solder dipping operation, said mask material comprising a thermoplastic, thermostable strippable base of polysulfone, a solvent for the polysulfone, said solvent chosen from the group consisting of orthodichlorobenzene, monochlorobenzene, methylene chloride and trichloroethylene, and a filler of finely divided silicon dioxide particles, said filler being operative to hold the molten polysulfone in place during the solder dipping operation.

4,120,844

MOLDED CALCIUM CARBONATE FILLED PROPYLENE RESIN COMPOSITES

Fred J. Meyer, Chelsea, and Seymour Newman, Southfield, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 9, 1977, Ser. No. 775,811
Int. Cl.[2] C08K 3/26
U.S. Cl. 260—42 2 Claims

1. A method for increasing impact strength of calcium carbonate filled propylene resin composites which comprises (A) admixing with high intensity rotary blade mixing (1) propylene resins which pass through a 20 mesh screen but are retained on a 325 mesh screen with (2) calcium carbonate filler which passes through a 60 mesh screen and at least 80% by weight passes through a 325 mesh screen to form a uniformly or substantially uniformly mixed powdery blend at a weight ratio of (2):(1) being about 7:13–9:11, the calcium carbonate filler having a number average particle diameter greater than 10 millimicrons, wherein the propylene resins comprise propylene homopolymer and copolymer and (B) fusing the uniformly or substantially uniformly mixed powdery blend which consists essentially of the particles of the filler and the particles of the resin to form the high impact composites.

4,120,845

SULFIDE CONTAINING TIN STABILIZERS

Thomas G. Kugele, Cincinnati, Ohio, assignor to Cincinnati Milacron Chemicals, Inc., Reading, Ohio

Division of Ser. No. 492,969, Jul. 26, 1974, Pat. No. 4,062,881. This application Aug. 22, 1977, Ser. No. 826,917
Int. Cl.[2] C08K 5/58
U.S. Cl. 260—45.75 S 57 Claims

1. A halogen containing vinyl of vinylidene polymer composition containing a monoorganotin or diorganotin mercaptoalkyl ester of a carboxylic acid or mercapto hydroxyalkyl ester of a carboxylic acid mono or polysulfide useful as a stabilizer for improving the resistance to deterioration of vinyl chloride polymers when heated at 350° F, containing at least one tin atom having one to two hydrocarbyl groups having from 1 to 20 carbon atoms and selected from the group consisting of alkyl, aryl, cycloalkyl, aralkyl and alkenyl and linked to the tin through carbon, at least one mercaptoalkyl ester of a carboxylic acid group linked to tin through the sulfur of the mercaptoalkyl group and at least one mono or polysulfide sulfur group bonded exclusively to tin, the organotin compound having an amount of tin within the range from 10 to 42% by weight and an amount of sulfur within the range from 8 to 42% by weight.

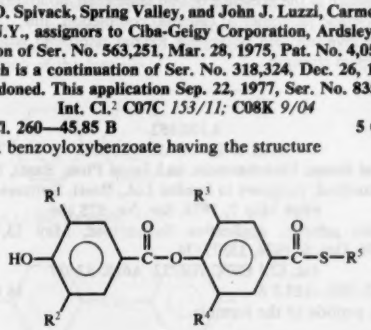
4,120,846

BENZOYLOXYBENZOATES AND COMPOSITIONS STABILIZED THEREWITH

John D. Spivack, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 563,251, Mar. 28, 1975, Pat. No. 4,051,104, which is a continuation of Ser. No. 318,324, Dec. 26, 1972, abandoned. This application Sep. 22, 1977, Ser. No. 835,760
Int. Cl.[2] C07C 153/11; C08K 9/04
U.S. Cl. 260—45.85 B 5 Claims

1. A benzoyloxybenzoate having the structure



wherein

R^1, R^2, R^3, and R^4 are tert-butyl groups,

R^5 is alkyl group having up to 30 carbon atoms, phenyl or alkyl substituted phenyl having up to 24 carbon atoms.

4. A composition of matter stabilized against degradation which comprises an organic material subject to oxidative and ultraviolet light degradation and a compound of claim 1.

4,120,847

HIGH ORTHO ETHERIFIED RESOLE RESINS

Harry M. Culbertson, Belchertown, Mass., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 647,958, Jan. 9, 1976, abandoned. This application Sep. 6, 1977, Ser. No. 830,537
Int. Cl.[2] C08G 8/36
U.S. Cl. 528—140 21 Claims

1. A high ortho etherified phenol-formaldehyde resole resin being characterized by:

A. having a reacted formaldehyde to phenol mol ratio of 1.10 to 2.0, said formaldehyde reacting with said phenol, forming methylol groups taking a final orientation of about 90% to 100% in the ortho position,

B. having said phenol selected from the group consisting of phenol, meta-substituted phenols and mixtures of phenol and substituted phenols,

C. having condensed phenol-aldehyde linkages wherein 25 to 90% of said linkages are benzyl ether linkages having a final orientation essentially in the ortho position and 10 to 75% are methylene linkages taking a final orientation of about 70 to 90% in the ortho position and about 10 to 30% in the para position,

D. having an average degree of polymerization of less than 4.0, and

E. having said methylol groups partially etherified with monohydric alcohols.

12. An improved process for preparing an etherified high ortho resole resin, said resin being characterized by:

A. having a reacted formaldehyde to phenol mol ratio of 1.10 to 2.0, said formaldehyde reacting with said phenol, forming methylol groups taking a final orientation of about 90% to 100% in the ortho position,

B. having said phenol selected from the group consisting of phenol, meta-substituted phenols and mixtures of phenol and substituted phenols,

C. having condensed phenol-aldehyde linkages wherein 25 to 90% of said linkages are benzyl ether linkages having a final orientation essentially in the ortho position and 10 to 75% are methylene linkages taking a final orientation of about 70 to 90% in the ortho position and about 10 to 30% in the para position,

D. having an average degree of polymerization of less than 4.0, and

E. having said methylol groups partially etherified with monohydric alcohols, said etherified resoles being prepared by first reacting said phenol and said formaldehyde in an aqueous reaction mixture under reflux at about 80° C. to 100° C., in the presence of a divalent electropositive metal ion, while maintaining the pH in the range of about 4 to 7, wherein said pH is controlled by having a sufficient amount of an organic acid present, forming said resole in said reaction mixture, the improvement comprising, etherifying said resole with a monohydric alcohol at a temperature of 65° to 100° C. in said reaction mixture and dehydrating the resultant aqueous reaction mixture to a water content of less than about 1 weight percent and an alcohol content of less than about 5% by weight providing an etherified high ortho resole resin as a single phase clear liquid varnish.

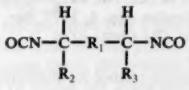
4,120,848

POLYURETHANE SPECTACLE FRAMES OR SINGLE PARTS THEREOF AND PROCESS FOR MAKING

Yoichi Mori; Kanichi Ueda, and Masao Takahashi, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

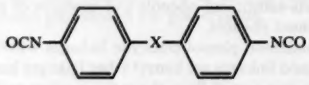
Filed Dec. 14, 1976, Ser. No. 750,567
Claims priority, application Japan, Dec. 19, 1975, 50/150659
Int. Cl.[2] C08G *18/76, 18/77, 18/42, 18/48*
U.S. Cl. 528—67 7 Claims

1. Spectacle frames or single parts thereof, having a heat distortion temperature of about 60° to about 70° C., a bending modulus of 19,500 to 23,500 kg/cm^2 and a hardness of 81 to 82, composed of a cured, reaction product which is prepared by the reaction of (1) a mixture of two types of diisocyanates represented by the following formulae (A) and (B):



(A)

wherein R_1 is a divalent aliphatic hydrocarbon group having 1 to 12 carbon atoms and R_2 and R_3, which may be the same or different, are hydrogen or an aliphatic hydrocarbon group having 1 to 8 carbon atoms,



(B)

wherein X is oxygen or a divalent aliphatic hydrocarbon group having 1 to 5 carbon atoms, with (2) a polyhydroxy compound having a hydroxyl value of 150 to 1,300, more than 2.0, on average, hydroxyl groups in the molecule and an average molecular weight of 300 to 5,000, the ratio in amount of the diisocyanate of type (b) to the total of the two types of diisocyanates (A) and (B) being in the range of 0.2 to 0.7 by mole and the ratio in amount of the total of the two types of diisocyanates (A) AND (B) to the polyhydroxy compound being such that the ratio in number of the isocyanato group (—NCO) present in the two types of diisocyanates (A) and (B) to the hydroxyl group (—OH) present in the polyhydroxy compound is in the range of 0.5 to 1.5.

4,120,849

PROCESS FOR CRYSTALLIZING AND DRYING POLYETHYLENE TEREPHTHALATE AND APPARATUS TO CARRY OUT SAID PROCESS

Siegfried Breitschaft, Augsburg, and Rolf Holtermann, Tafertingen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 16, 1976, Ser. No. 751,014
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 2558730
Int. Cl.[2] C08G *63/74*
U.S. Cl. 528—502 2 Claims

1. A process for crystallizing and drying granules of amorphous polyethylene terephthalate by treating same with hot gases at a temperature of from 120° to 190° C., the hot gases passing through a cylindrical layer of loose polyester granules, which comprises crystallizing and drying the polyethylene terephthalate in a single process step with avoidance of fluidization and movement of said layer wherein under the action of the hot gases the cylindrical layer of loose polyester granules agglomerates to a cylindrical block, destroying said cylindrical block from the bottom thereof by scratching it off in layers by means of a perforated tray rotating about its vertical axis and provided with stripping edges and discharge slots, and discharging the disintegrated polyester material through the discharge slots of the perforated tray.

4,120,850

POLYETHER URETHANE POLYMERS PREPARED FROM A COPOLYMER OF TETRAHYDROFURAN AND ETHYLENE OXIDE

Engelbert Pechhold, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 6, 1977, Ser. No. 830,472
Int. Cl.[2] C08G *18/48*
U.S. Cl. 528—66 9 Claims

1. A polyether urethane polymer which is the reaction product of

(a) a copolymer of tetrahydrofuran and ethylene oxide or propylene oxide, the copolymer containing about 20% to about 70%, by weight, of ethylene oxide or propylene oxide units and having a number average molecular weight of about 550 to about 3,000 and a hydroxyl functionality of 2.0;

(b) an organic diisocyanate; and

(c) 1,4-butanediol or hydroquinone bis(betahydroxyethyl)ether.

4,120,851

PROCESS FOR POLYMERIZING HIGH NITRILE ABS POLYBLENDS

Henry K. Chi, Longmeadow, and Alton L. Higgins, Springfield, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 22, 1977, Ser. No. 826,442
Int. Cl.[2] C08F *297/04*
U.S. Cl. 260—880 R 20 Claims

1. In a process for preparing an ABS polyblend by:

A. emulsion polymerizing a mixture consisting essentially of a monomer formulation dispersed in a diene rubber aqueous latex, grafting at least a portion of said monomer formulation as superstrate interpolymer on said rubber as a substrate providing a graft copolymer, said monomer formulation consisting essentially of a monovinylidene aromatic monomer and an ethylenically unsaturated nitrile monomer, forming during polymerization thereof an ABS polyblend of said graft copolymer and a matrix interpolymer, the improvement comprising:

B. emulsion polymerizing said mixture to a conversion of from about 85 to 98% as a partially polymerized mixture,

C. charging additional monovinylidene aromatic monomer as a sole monomer to said partially polymerized mixture in an amount of about 2–15% by weight of said monomer formulation,

D. further emulsion polymerizing said partially polymerized mixture in the presence of said additional monovinylidene aromatic monomer to essential completion, and

E. recovering said polyblend having improved color and impact strength.

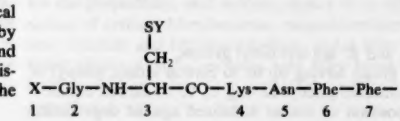
4,120,852

ORGANIC COMPOUNDS

Wilfried Bauer, Munchenstein, and Janos Pless, Basel, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed May 7, 1975, Ser. No. 575,156
Claims priority, application Switzerland, May 13, 1974, 6493/74; Oct. 4, 1974, 13377/74
Int. Cl.[2] C07C *103/52;* A61K *37/00*
U.S. Cl. 260—112.5 S 16 Claims

1. A peptide of the formula



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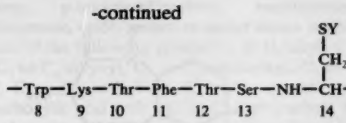


in free base form, pharmaceutically acceptable acid addition salt form or pharmaceutically acceptable complex form where

X is H-Ala, D-Ala, β-Ala, propionyl or Ac-Ala (wherein Ac is pharmaceutically acceptable acyl),

Y is hydrogen or a direct bond between the sulphur atoms in positions 3 and 14, and

Z is the radical —COOH, —$COOR_1$ (wherein R_1 is lower alkyl),

(wherein R_2 and R_3 independently are hydrogen or lower alkyl) or —CH_2OH,

with the proviso that X is other than H-Ala, when Z is COOH.

4,120,853

ESTERIFICATION OF CARBOXYLIC ACIDS BY CONTACT WITH A PHOSPHONIUM SALT

Noboru Yamazaki, and Fukuji Higashi, both of Tokyo, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

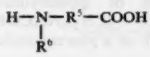
Division of Ser. No. 688,289, May 20, 1976, which is a division of Ser. No. 475,877, Jun. 3, 1974, Pat. No. 3,974,219, which is a continuation-in-part of Ser. No. 305,256, Nov. 10, 1972, abandoned. This application Jul. 13, 1977, Ser. No. 815,242

Claims priority, application Japan, Nov. 22, 1971, 46-93872; Feb. 19, 1972, 47-17355

Int. Cl.[2] **C07C** *103/52*

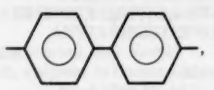
U.S. Cl. 260—112.5 R **4 Claims**

1. A process for producing an active ester of an amino acid having a protected amino group which comprises reacting the carboxyl group of an amino acid of the formula,

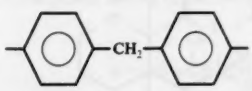


(IV)

having a protected amino group, wherein R^5 is alkylene or alkylidene having 1–30 carbon atoms which may have a substituent selected from the group consisting of phenyl, salicyl, canbamoyl and carboxyl cycloalkylene or cycloalkylidene having 3–8 carbon atoms, phenylene, a group of the formula



a group of the formula



or a group in which two or more groups selected from the group consisting of the above-mentioned aliphatic and aromatic hydrocarbon groups are bonded through —CONH—; and R^6 is hydrogen or alkyl having 1–4 carbon atoms, with a phosphonium salt obtained by reacting a phosphorous ester selected from the group consisting of monomethyl, monoethyl, monoisopropyl, monophenyl, dimethyl, diethyl, diisopropyl, di-n-butyl, diphenyl, triethyl, triisopropyl and tributyl esters of phosphorous acid and an ammonium salt of the phosphorous monoester, with an organic base selected from the group consisting of pyridine, 2-methylpyridine, 3-methylpyridine, 4-methylpyridine, 2,6-dimethylpyridine or triethylamine, and an oxidizing agent selected from the group consisting of bromine, iodine, mercurous chloride, mercuric chloride, mercuric bromide or mercuric acetate, at a temperature of from 30° to 200° C., and then reacting the activated amino acid with a hydroxyl or mercapto group-containing compound of the formula

R^4OH (III-a)

or

R^4SH (III-b)

wherein R^4 is alkyl having 1–18 carbon atoms, cycloalkyl having 3–8 carbon atoms, phenyl, naphthyl, aryl having at least one substituent selected from the group consisting of alkyl having 1–4 carbon atoms, nitro, cyano, N,N-dimethylamino and methoxycarbonyl, or phenylalkyl having 7–12 carbon atoms, at a temperature of from 0° to 200° C.

4,120,854

DISAZO AND TRISAZO DYES HAVING A 1,3-DIAMINO-, DIHYDROXY- OR AMINO-HYDROXY-BENZENE NUCLEUS AND METAL COMPLEXES THEREOF

Heinz Wicki, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

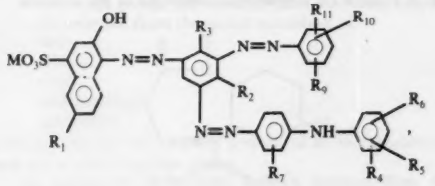
Continuation-in-part of Ser. No. 563,872, Mar. 31, 1975, abandoned. This application Sep. 27, 1976, Ser. No. 726,979

Claims priority, application Switzerland, Apr. 10, 1974, 5066/74; Nov. 14, 1974, 15186/74; Nov. 25, 1974, 15620/74; Nov. 25, 1974, 15621/74

Int. Cl.[2] **C09B** *33/02, 33/20, 45/24, 45/34*

U.S. Cl. 260—145 C **43 Claims**

1. A 1:1 copper, 1:1 nickel, 1:2 chromium, 1:2 cobalt or 1:2 iron complex of a comound of the formula



or a mixture of such complexes, wherein

R_1 is hydrogen or nitro,

R_2 is hydroxy or —NH_2,

R_3 is hydroxy or —NH_2,

R_4 is hydrogen, nitro or C_{1-4} alkyl,

R_5 is hydrogen, nitro or C_{1-4} alkoxy,

R_6 is hydrogen, C_{1-4}alkyl, C_{1-4}alkoxy, —COOM or —SO_3M,

R_7 is hydrogen or —SO_3M,

R_9 is hydrogen, hydroxy, —NH_2, C_{1-4}alkyl or C_{1-4}alkoxy,

R_{10} is hydrogen, nitro, —COOM or —SO_3M,

R_{11} is hydrogen, fluoro, chloro, bromo, iodo, nitro or C_{1-4}alkyl, and

each M is hydrogen or a non-chromophoric cation,

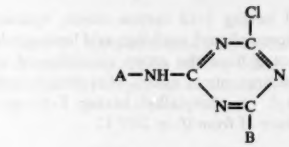
wherein each 1:2 chromium, 1:2 cobalt and 1:2 iron complex has an additional M balancing the negative charge of the complexed metal atom.

4,120,855
BACTERICIDALLY ACTIVE MONOCHLOROTRIAZINE DYES

Vladimir Leibovich Liverant, ulitsa Lenina, 50, kv. 15; Lev Moiseevich Yagupolsky, ulitsa I.Kudri, 41, kv. 48; Andrei Yakovlevich Ilichenko, ulitsa I.Kudri, 39, kv. 45; Faina Borisovna Timashpolskaya, ulitsa Miljutenko, 11/1, kv. 106; Elena Alexeevna Fedorovskaya, ulitsa Yakira, 16/8, korpus 2, kv. 29; Lidia Ivanovna Petrik, Vozdukhoflotsky prospekt, 52, kv. 139, all of Kiev; Iosif Yakubovich Kalantarov, ulitsa Kuibysheva, 4/1, kv. 15, Dushanbe; Mira Semenovna Kopylova, ulitsa Patorzhinskogo, 16, kv. 4, Kiev, and Idima Evgenievna Meitus, ulitsa Putovskogo, 69, kv. 26, Dushanbe, all of U.S.S.R.

Filed Oct. 18, 1976, Ser. No. 733,369
Int. Cl.[2] C09B *62/06, 62/08, 62/10;* **A61L** *1/00*
U.S. Cl. 260—153 **5 Claims**

1. A bactericidally active monochlorotrizine dye compound having the formula:



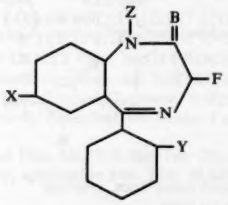
wherein A is chromophoric; and B is a bactericidal component selected from the group consisting of hydroxyl derivatives, antibiotics, and NH_2 derivatives.

4,120,856
PROCESS FOR THE PREPARATION OF 3-FLUOROBENZODIAZEPINES

Elena Maria Bingham, Wilmington, Del., and William Joseph Middleton, Chadds Ford, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 687,318, May 26, 1976, which is a continuation-in-part of Ser. No. 597,502, Jul. 31, 1975, abandoned. This application Nov. 23, 1977, Ser. No. 854,261
Int. Cl.[2] C07D *243/26, 487/04*
U.S. Cl. 260—239.3 D **1 Claim**

1. A Process for preparing a compound of the formula:



wherein

X is Cl, Br, NO_2 or CF_3;

Y is H, Cl, Br or F;

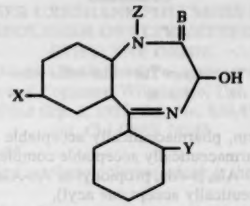
Z is H, hydrocarbyl of 1-4 carbons, $—CH_2—CF_3$, —COHNR, $—CH_2—CH_2NR_2$ or $—CH_2CH_2NR_2.A$, where R is alkyl of 1-4 carbons, and A is a pharmaceutically suitable acid;

B is O; or

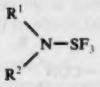
B and Z together is $=N—N=C(R')$-where R' is H or C_1-C_4 alkyl

which comprises:

contacting, under substantially anhydrous conditions at a temperature of about −80° to +10° C., a compound of the formula



with a compound of the formula:



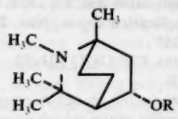
where B, X, Y and Z are as previously defined, and R^1 and R^2 individually are a primary alkyl group of 1–4 carbons or taken together are $—(CH_2)_4—$ or $—(CH_2)_5—$.

4,120,857
DERIVATIVES OF 1,2,3,3-TETRAMETHYL-2-AZABICYCLO[2.2.2]OCTAN-5-ENDO-OL

Mario Longobardi, Via S. Martino 49/4, 16131 Genova; Pietro Schenone, Via Zara 25-1, 16145 Genova, and Francesco Bondavalli, Via Genova 6F/13, 17100 Savona, all of Italy

Filed Apr. 26, 1977, Ser. No. 791,096
Int. Cl.[2] C07D *221/24*
U.S. Cl. 260—293.54 **10 Claims**

1. A compound having the formula



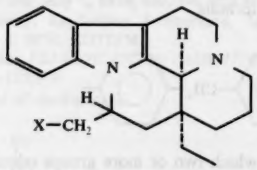
wherein R is $—COR_1$ in which R_1 is cyclo(lower)alkyl, p-aminophenyl, 3,4,5-trimethoxyphenyl or diphenylmethyl, $—CONHR_2$ in which R_2 is phenyl, or $—(CH_2)_3NHCOR_3$ in which R_3 is phenyl or diphenylmethyl; or a pharmaceutically acceptable acid addition salt thereof.

4,120,858
14-SUBSTITUTED VINCANES

Otto Clauder; Jozsef Kökösi; Laszlo Szporny, and Egon Kárpati, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Aug. 30, 1976, Ser. No. 719,066
Claims priority, application Hungary, Sep. 1, 1975, RI 577
Int. Cl.[2] C07D *519/04*
U.S. Cl. 260—293.55 **7 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof, wherein X is a straight or branched chain lower alkanesulfonyloxy, ben-

zenesulfonyloxy, p-toluenesulfonyloxy, naphthalenesulfonyloxy, thiocyanato, azido, amino, or amino mono- or disubstituted by one of the following groups: C_1 to C_6 alkyl, C_2 to C_6 alkenyl, C_2 to C_6 alkynyl, C_3 to C_{20} cycloalkyl, C_3 to C_{20} cycloalkenyl, C_7 to C_{20} araliphatic, C_6 to C_{14} aromatic, acyl group of a carboxylic acid with a C_1 to C_6 hydrocarbon, acyl group of a carboxylic acid with a C_1 to C_6 hydrocarbon substituted by halogen, oxo, amino, phenyl, diphenyl or naphthyl, benzoyl, C_1 to C_6 alkoxycarbonyl, C_3 to C_{20} cycloalkyloxycarbonyl, C_7 to C_{20} aralkoxycarbonyl, aminocarboimido, and pymolidino, piperidino, perhydroazepino and 4-methylpiperidino group formed with the nitrogen of said amino.

4,120,859

(N-SUBSTITUTED-PYRIDYL)-ALKYL SULFONIC ACID BETAINES AS ELECTROPLATING ADDITIVES

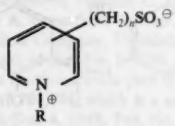
Kurt Pluss, and Bruno Romano De Martin, both of Schaffhausen, Switzerland, assignors to Cilag-Chemie A.G., Schaffhausen, Switzerland

Division of Ser. No. 763,452, Jan. 27, 1977, Pat. No. 4,067,785, which is a continuation-in-part of Ser. No. 666,525, Mar. 12, 1976, abandoned. This application Jul. 15, 1977, Ser. No. 816,104

Int. Cl.[2] **C07D** *213/52*

U.S. Cl. 260—294.8 R **16 Claims**

1. A pyridyl alkyl sulfonic acid betaine having the formula:



in which the substituent $-(CH_2)_nSO_3^{\ominus}$ is in the 2- or 4-position of the pyridyl ring; *n* is the integer 1 or 2; and R is a member selected from the group consisting of methyl; methallyl; benzyl; halobenzyl wherein said halo has an atomic weight less than 80; loweralkylbenzyl wherein said loweralkyl has from 1 to 4 carbons; and benzyl substituted with the group:

wherein the substituent $-(CH_2)_nSO_3^{\ominus}$ is in the 2- or 4-position of the pyridyl ring and *n* is the integer 1 or 2.

4,120,860

3-ARYL-1-(2- OR 4-IMINODIHYDRO-1-PYRIDYL)-2-PROPANOL ANTIARRHYTHMIC COMPOUNDS

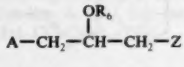
Julius Diamond, and Ronald A. Wohl, both of Morris Plains, N.J., assignors to Cooper Laboratories, Inc., Parsippany, N.J.

Filed May 10, 1977, Ser. No. 795,530

Int. Cl.[2] **C07D** *211/80*

U.S. Cl. 260—296 R **16 Claims**

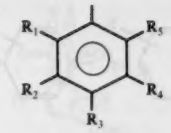
1. A compound having the structural formula:



wherein:

A is an aromatic radical selected from the group consisting of:

(a) substituted phenyl groups having the formula:



wherein R_1, R_2, R_3, R_4, and R_5, which may be the same or different are substituents selected from the group consisting of:

hydrogen,
alkyl,
alkenyl,
alkynyl,
cycloalkyl,
phenyl,
alkoxy,
halo,
hydroxy,
hydroxymethyl,
amino,
acyloxy,
acylamino,
acylalkylamino,
dialkylamino,
trifluoromethyl,
nitro,
cyano,
acyl,
formyl,
carboxy,
alkoxycarbonyl,
carbamoyl,
alkylsulfonyl,
alkoxyalkyl,
carboxyalkyl,
carbamoylalkyl,
alkoxyalkoxy,

provided that at least one of R_1, R_2, R_3, R_4, and R_5 must be hydrogen, no more than 4 may be loweralkyl, no more than three may be loweralkoxy, no more than 2 may be halogen, and no more than one may be any of the other substituents; and the total carbon content of all the substituents must not exceed 6 carbon atoms;

(b) naphthyl and naphthyl substituted with no more than two alkyl groups and no more than one other substituent selected from the group consisting of

halo,
alkoxy,
nitro,
aminosulfonyl,
acylamino,

provided that the total carbon content of all the substituents must not exceed 4 carbon atoms;

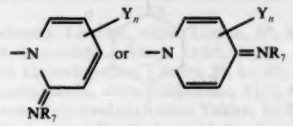
(c) polycyclic carbocyclic radicals selected from the group consisting of

indenyl,
indanyl,
5,6,7,8-tetrahydronaphthyl,
6,7,8,9-tetrahydro-5H-benzocycloheptenyl,
5,6,7,8,9,10-hexahydrobenzocyclooctenyl,
5,6,7,8-tetrahydro-5,8-methano-1-naphthyl
5,6,7,8-tetrahydro-5,8-ethano-1-naphthyl,

(d) bicyclic heterocyclic radicals selected from the group consisting of

4-benzofuranyl,
7-benzofuranyl,
2-acetyl-7-benzofuranyl,
4-benzothienyl,
7-benzothienyl,
8-thiochromanyl,
5-quinolyl,
5-isoquinolyl;

Z is an iminopyridyl radical having the structural formula



wherein:

Y is selected from the group consisting of
hydrogen,
loweralkyl,
loweralkenyl,
loweralkoxy,
loweralkoxycarbonyl,
loweracyloxy,
loweracylamino,
carbamoyl,
cyano,
halo,

and $n = 1$ or 2 when Y is loweralkyl or halo,

and $n = 1$ in all other cases;

R_6 is selected from the group consisting of hydrogen,
loweralkoxycarbonyl,
loweracyl,
carboxyloweracyl,
carbamoyl,
thiocarbamoyl and

R_7 is selected from the group consisting of
hydrogen,
loweralkyl,
loweralkenyl,
loweralkynyl,
C_3-C_6 cycloalkyl,
C_4-C_8 cycloalkylalkyl,
phenyl,
benzyl,
phenylethyl,
loweralkoxycarbonyl,
loweracyl,
carboxyloweracyl,
carbamoyl,
thiocarbamoyl;

and pharmaceutically acceptable acid addition salts.

13. 3-(1-Naphthyl)-1-(2-imino-1,2-dihydro-3-methyl-1-pyridyl)-2-propanol and pharmaceutically acceptable acid addition salts.

4,120,861

2-(5-PHENYL-1,3,4-THIADIAZOL-2-YL)BENZOIC ACID

Walter G. Brouwer, Guelph; Edwin J. MacPherson, Elmira, both of Canada; Ronald B. Ames, Naugatuck, Conn.; Robert W. Neidermyer, Cheshire, Conn., and Charles E. Crittendon, Cheshire, Conn., assignors to Uniroyal, Inc., New York, N.Y. and Uniroyal Ltd., Ontario, Canada

Division of Ser. No. 648,237, Jan. 12, 1976, Pat. No. 4,035,175, which is a division of Ser. No. 492,376, Jul. 29, 1974, Pat. No. 3,947,263. This application May 2, 1977, Ser. No. 793,111

Int. Cl.[2] C07D *285/12*

U.S. Cl. 260—302 D **1 Claim**

1. 2-(5-Phenyl-1,3,4-thiadiazol-2-yl)benzoic acid.

4,120,862

USE OF COPPER HALIDE CATALYSTS AND CERTAIN EPOXY COMPOUNDS TO OXIDIZE NITRO-SUBSTITUTED SCHIFF BASES TO BENZOXAZOLES

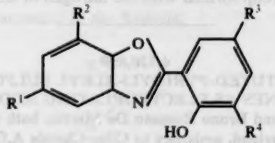
Donald N. Brattesani, Oakland, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 25, 1977, Ser. No. 827,649

Int. Cl.[2] C07D *263/56*

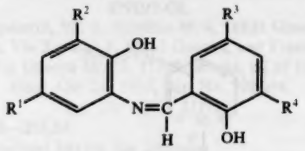
U.S. Cl. 260—307 D **10 Claims**

1. The method of preparing benzoxazoles of the formula



wherein one of R^3 and R^4 is —NO2 and the other is —H, —NO2 or alkyl of 1 to 20 carbons and R^1 and R^2 are independently —H or alkyl of 1 to 20 carbons, with the proviso that R^1, R^2, R^3 and R^4 contain a total of at least 6 carbons,

said method comprising contacting a corresponding Schiff base of the formula



wherein R^1, R^2, R^3 and R^4 are as above defined, with a copper halide catalyst CuX_n, X being Br or Cl and n being 1 or 2, and with a peroxy compound of the formula R^5—O—O—R^6, in which R^6 is H or R^5 and R^5, independently, in each occurrence, is a hydrocarbyl group of 2 to 20 carbons,

said contacting being effected by agitating a mixture of said Schiff base, said catalyst, said peroxy compound and an inert liquid, at a temperature of at least 25° C., for at least 5 minutes.

4,120,863

FLUORINE-CONTAINING BENZOXAZOLES

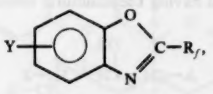
Christ Tamborski, and John B. Christian, both of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 27, 1977, Ser. No. 837,329

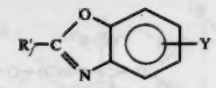
Int. Cl.[2] C07D *263/56*

U.S. Cl. 260—307 D **5 Claims**

1. A fluorine-containing benzoxazole having the following structural formula:



wherein R_f is C_xF_{2x+1}, where x is an integer from 1 to 10, inclusive; $CF_3(OCF_2CF_2)_yOC_2F_5$, where y is zero or an integer from 1 to 10, inclusive; $CF(CF_3)[OCF_2CF(CF_3)]_zOC_3F_7$, where z is zero or an integer from 1 to 10, inclusive; or



where R_f' is $(CF_2)_4O(CF_2)_4O(CF_2)_4$ or $Z[CF(CF_3)CF_2O]_n(CF_2)_4[OCF_2CF(CF_3)]_nZ$, where each Z is $(CF_2)_4O$ or $CF(CF_3)OCF_2CF_2O$, and n is an integer from 1 to 5, inclusive; and Y is C_xF_{2x+1}, where x is an integer from 1 to 10, inclusive; $CF_2(OCF_2CF_2)_yOC_2F_5$, where y is zero or an integer from 1 to 10, inclusive; $CF(CF_3)[OCF_2CF(CF_3)-]_zOC_3F_7$, where z is zero or an integer from 1 to 10, inclusive; or hydrogen, R_f being C_xF_{2x+1} only when Y is other than hydrogen.

4,120,864

1,2,4-4H-TRIAZOLE DERIVATIVES

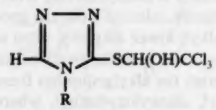
Michael C. Seidel, Levittown; William C. von Meyer, Willow Grove, and Stanley A. Greenfield, Ambler, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 67,198, Aug. 26, 1970, abandoned, which is a continuation-in-part of Ser. No. 847,481, Jul. 3, 1969, Pat. No. 3,701,784, which is a continuation-in-part of Ser. No. 757,490, Sep. 4, 1968, Pat. No. 3,769,411. This application Jun. 30, 1972, Ser. No. 267,766

Int. Cl.[2] C07D *249/12*

U.S. Cl. 260—308 R **2 Claims**

1. A compound of the formula



wherein R is alkyl straight or branched of 1 to 12 carbon atoms.

4,120,865

METAL COMPLEX AND METHOD FOR PREPARING

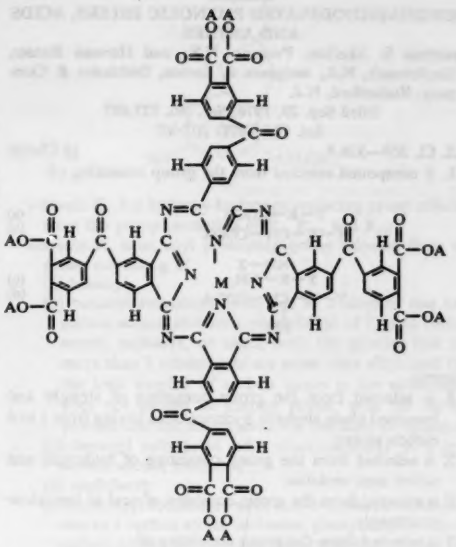
Clifford Ward, Louisa, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 753,400, Dec. 22, 1976, Pat. No. 4,090,954. This application Sep. 6, 1977, Ser. No. 830,513

Int. Cl.[2] C09B *47/04*

U.S. Cl. 260—314.5 **7 Claims**

1. A catalyst for oxidizing soluble alkali mercaptide compounds to disulfide compounds in an aqueous alkaline solution, comprising a metal complex of 2,3, 7,8,12,13,17,18-tetra [1,2-benzo-4 (4'-phthaloyl)]-porphyrazine-2-,22,23,24-tetraene, or a substituted derivative thereof having the structural formula:



where M is a metal selected from the group consisting of iron, manganese, chromium, magnesium, copper, nickel, zinc, titanium, hafnium, thorium, tin, lead, columbium, tantalum, antimony, bismuth, molybdenum, palladium, platinum, silver, mercury, vanadium and cobalt and A is hydrogen or an alkali metal.

4,120,866

PREPARATION OF ARYLSULPHONIUM SALTS

Adolf Winkler, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sep. 16, 1977, Ser. No. 833,927

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1976, 2644591

Int. Cl.[2] C07D *209/82*

U.S. Cl. 260—315 **9 Claims**

1. A process for the production of an arylsulphonium fluoride, comprising reacting an aromatic compound of the formula

Ar—H

in which Ar is an aromatic radical with a sulphoxide of the formula

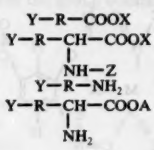
in which R^1 and R^2 each independently is an aliphatic or aromatic radical or, together, a divalent radical, in the presence of hydrogen fluoride.

4,120,867
MONORADIOIODINATED PHENOLIC ESTERS, ACIDS AND AMINES

Anandrao S. Akerkar, Pomona, N.Y., and Herman Rutner, Hackensack, N.J., assignors to Becton, Dickinson & Company, Rutherford, N.J.

Filed Sep. 29, 1976, Ser. No. 727,407
Int. Cl.[2] C07D *207/40*
U.S. Cl. 260—326.4 18 Claims

1. A compound selected from the group consisting of:



(a) (b) (c) (d)

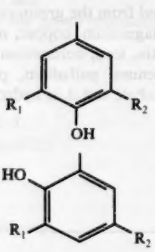
wherein

R is selected from the group consisting of straight and branched chain aliphatic hydrocarbons having from 1 to 6 carbon atoms;

X is selected from the group consisting of hydrogen and active ester moieties;

Z is selected from the group consistng of acyl or benzyloxycarbonyl;

Y is selected from the group consisting of:



I II

wherein one of R_1 and R_2 is a radioiostope of iodine and the other of R_1 and R_2 is selected from the group consisting of lower alkyl, lower alkoxy, fluoro-, chloro-, bromo-, and nitro-;

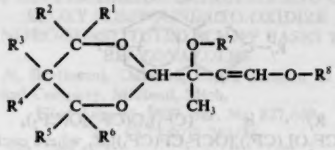
A is selected from the group consisting of hydrogen, lower alkyl, an alkali metal and an alkaline earth metal.

4,120,868
CYCLIC 2-METHYL-2,4-DIALKOXY-3-BUTEN-1-AL-ACETALS, THEIR PREPARATION AND USE

Hagen Jaedicke, Ludwigshafen, and Joachim Paust, Neuhofen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 9, 1977, Ser. No. 859,020
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1976, 2659507
Int. Cl.[2] C07D *319/04*
U.S. Cl. 260—340.7 1 Claim

1. A cyclic 2-methyl-2,4-dialkoxy-3-buten-1-al-acetal of the general formula I



(I)

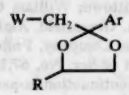
where R^1 to R^6 are H, $-CH_3$ or $-C_2H_5$ and R^7 and R^8 may be identical or different and are alkyl of 1 to 10 carbon atoms.

4,120,869
2-ARYL-1,3-DIOXOLANES

Jan Heeres, Vosselaar, Belgium, assignor to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 732,826, Oct. 15, 1976, which is a continuation-in-part of Ser. No. 619,863, Oct. 6, 1975, abandoned, which is a continuation-in-part of Ser. No. 544,157, Jan. 27, 1975, Pat. No. 3,936,470. This application Jun. 2, 1977, Ser. No. 802,701
Int. Cl.[2] C07D *317/10*
U.S. Cl. 260—340.9 R 1 Claim

1. A chemical compound having the formula:



wherein:

W is a member selected from the group consisting of halo, (4-methylphenyl)sulfonyloxy and methylsulfonyloxy;

Ar is a member selected from the group consisting of phenyl, substituted phenyl, and naphthalenyl, and wherein said substituted phenyl is phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, nitro and cyano; and

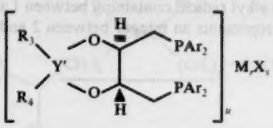
R is a member selected from the group consisting of alkyloxymethyl wherein the alkylgroup has from 1 to 10 carbon atoms, alkenyl, alkenyloxymethyl, wherein said alkenyl has from 2 to 10 carbon atoms, hydroxymethyl, 2-propynyloxymethyl, halomethyl, arylmethyl and arylmethoxymethyl, wherein said aryl is a member selected from the group consisting of phenyl, substituted phenyl, naphthalenyl and mono- and di-halonaphthalenyl, and wherein said substituted phenyl is phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, cyano, nitro, phenyl, phenylmethyl, benzoyl, halobenzoyl, lower alkylcarbonyl, lower alkyloxycarbonyl and trifluoromethyl, provided that when more than 1 substituents are present only 1 thereof may be selected from the group consisting of phenyl, phenylmethyl, benzoyl and halobenzoyl.

4,120,870
METAL PHOSPHINE COMPLEX

John Melvin Townsend, Montclair, and Donald Herman Valentine, Jr., Highland Park, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jul. 18, 1977, Ser. No. 816,235
Int. Cl.[2] C07D *317/10*
U.S. Cl. 260—340.9 R 7 Claims

1. A compound of the formula



wherein R_3 and R_4 are alkyl or aryl or taken together with Y' form a substituted or unsubstituted cycloalkyl ring: Y' is carbon; P is phosphorus: Ar is phenyl, naphthyl anthryl phenanthryl or azulyl which may be substituted in one or more positions with a lower alkyl, halogen, lower alkoxy, amino, nitro, mono and di-lower alkylamino group; M is a Group IB or IIB metal; X is selected from the group consisting of halide, perchlorate, tetrahalogenoborate, hexahalogenophosphate, or hexahalogenoantimonate wherein said halogenates comprise fluorine and chlorine, and tetraphenylborate; *u* is an integer from 1–3; *r* and *s* are 1 or 2 depending on the valence of M and the value of *u*; the dimers or oligomers thereof.

4,120,871
5-ORGANOSULFONYL, 5-ORGANOSULFINYL OR 5-HALOALKANOYL-BENZOFURAN-2-ONES

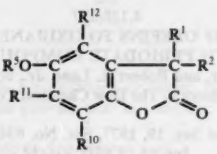
Peter Stuart Gates, Cambridge; John Gillon, Great Shelford, and David Thomas Saggers, Saffron Walden, all of England, assignors to Fisons Limited, England

Division of Ser. No. 575,361, May 6, 1975, Pat. No. 4,051,154, which is a continuation of Ser. No. 279,262, Aug. 9, 1972, Pat. No. 3,937,702, which is a continuation of Ser. No. 826,274, May 20, 1969, Pat. No. 3,689,507. This application Jul. 11, 1977, Ser. No. 815,058

Int. Cl.[2] **C07D** *307/83*

U.S. Cl. 260—343.3 R **3 Claims**

1. A benzofuranyl compound of the formula:



wherein R^1 and R^2 are the same or different and are selected from the group consisting of hydrogen and alkyl of 1–6 carbon atoms; R^5 is selected from the group consisting of R^8CO—, R^9SO_2— and R^9SO—, in which R^8 is halogen substituted alkyl of 1–4 carbon atoms, and R^9 is selected from the group consisting of (a) alkyl of 1–4 carbon atoms, (b) substituted alkyl of 1–4 carbon atoms wherein the substituent is selected from the group of halogen and alkoxy of 1–6 carbon atoms, (c) phenyl and (d) phenyl substituted by a member of the group of halogen and alkyl of 1–4 carbon atoms and R^{10}, R^{11} and R^{12} are the same or difference and are selected from the group consisting of hydrogen, alkyl of 1–4 carbon atoms, halogen, cyano, acetyl and alkoxy of 1–4 carbon atoms.

4,120,872
4α,6-DIHYDROXY-2α-HYDROXY-METHYL-3β-TETRAHYDROPYRAN ACETIC ACID γ LACTONE DERIVATIVES

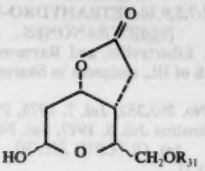
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 676,893, Apr. 14, 1976, Pat. No. 4,048,194. This application May 12, 1977, Ser. No. 796,090

Int. Cl.[2] **C07D** *493/04*

U.S. Cl. 260—343.6 **2 Claims**

1. A thromboxane intermediate of the formula



wherein R_{31} is a hydroxy-hydrogen replacing group selected from the group consisting of R_9, R_{10}, and R_{34};

wherein R_9 is an acyl protecting group selected from the group consisting of

(a) benzoyl;

(b) benzoyl substituted with one to 5 alkyl of one to 4 carbon atoms, inclusive, phenylalkyl of 7 to 12 carbon atoms, inclusive, or nitro, with the proviso that not more than 2 substituents are other than alkyl, and that the total number of carbon atoms in the substituents does not exceed 10 carbon atoms, with the further proviso that the substituents are the same or different.

(c) benzoyl substituted with alkoxycarbonyl of 2 to 5 carbon atoms, inclusive;

(d) naphthoyl;

(e) naphthoyl substituted with one to 9, inclusive, alkyl of one to 4 carbon atoms, inclusive, phenylalkyl of 7 to 10 carbon atoms, inclusive, or nitro, with the proviso that not more than 2 substituents on either of the fused aromatic rings are other than alkyl and that the total number of carbon atoms in the substituents on either of the fused aromatic rings does not exceed 10 carbon atoms, with the further proviso that the various substituents are the same or different; and

(f) alkanoyl of 2 to 12 carbon atoms, inclusive;

wherein R_{10} is a blocking group selected from the group consisting of

(a) tetrahydropyranyl;

(b) tetrahydrofuranyl; and

(c) a group of the formula

$$—C(OR_{11})(R_{12})—CH(R_{13})(R_{14}),$$

wherein R_{11} is alkyl of one to 18 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl or phenyl substituted with one to 3 alkyl of one to 4 carbon atoms, inclusive, wherein R_{12} and R_{13} are alkyl of one to 4 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 alkyl of one to 4 carbon atoms, inclusive, or when R_{12} and R_{13} are taken together $—(CH_2)_a—$ or $—(CH_2)_b—O—(CH_2)_c$, wherein *a* is 3, 4, or 5, or *b* is one, 2, or 3, and *c* is one, 2, or 3, with the proviso that *b* plus *c* is 2, 3, or 4, with the further proviso that R_{12} and R_{13} may be the same or different, and wherein R_{14} is hydrogen or phenyl;

wherein R_{34} is an arylmethyl hydroxy-hydrogen replacing group selected from the group consisting of

(a) benzyl,

(b) benzyl substituted by one to five alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive, with the further proviso that the various substituents are the same or different,

(c) benzhydryl,

(d) benzhydryl substituted by one to ten alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive,

(e) trityl, and

(f) trityl substituted by one to 15 alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive.

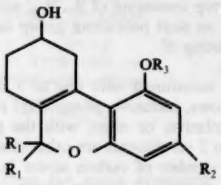
4,120,873

9-HYDROXY-7,8,9,10-TETRAHYDRO-6H-DIBENZO [b][d]PYRANONES

Cheuk Man Lee, Libertyville, and Raymond John Michaels, Mundelein, both of Ill., assignors to Sharps Associates, Cambridge, Mass.

Division of Ser. No. 593,352, Jul. 7, 1975, Pat. No. 4,066,667. This application Jul. 8, 1977, Ser. No. 813,994
Int. Cl.[2] C07D *311/80*
U.S. Cl. 260—343.21 **11 Claims**

1. A compound of the formula



wherein R_1R_1 is oxygen; R_2 *is* C_1–C_{20} alkyl or (halogen substituted phenyl C_1–C_{20}) alkyl; and R_3 is hydrogen, loweralkyl, loweralkenyl, or loweralkynyl.

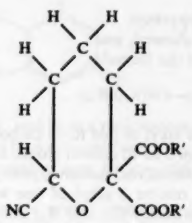
4,120,874

DIESTERS OF 6-CYANO-2,2-TETRAHYDROPYRANDICARBOXYLATES

Marvin M. Crutchfield, Creve Coeur, Mo., and Kent P. Lannert, Freeburg, Ill., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 5, 1977, Ser. No. 756,946
Int. Cl.[2] C07D *309/28*
U.S. Cl. 260—345.8 R **1 Claim**

1. A compound of the formula



wherein R' is lower alkyl.

4,120,875

NOVEL CURING AGENTS DERIVED FROM ORGANOTHIOSTANNOIC ACIDS

Justin L. Hirshman, East Brunswick, N.J., and Robert V. Russo, Brooklyn, N.Y., assignors to M&T Chemicals Inc., Stamford, Conn.

Filed Aug. 26, 1974, Ser. No. 500,248
Int. Cl.[2] C07D *307/60*
U.S. Cl. 260—346.11 **3 Claims**

1. A curing agent for epoxide compounds, wherein said curing agent consists essentially of the reaction product obtained by heating at between 100° and 200° C. for between 30 and about 120 minutes a mixture comprising 1) a carboxylic acid anhydride selected from the group, consisting of acetic, propionic, butyric, benzoic, naphthoic, azelaic, sebasic, succinic, alkenylsuccinic, itaconic, citraconic, phthalic, maleic, trimelletic, chlorendic, tetrabromophthalic and tetrachlorophthalic anhydrides, benzophenonetetracarboxylic, pyromellitic dianhydride, ethylene glycol bis-trimellitate dianhydride, glycerol tris-trimellitate trianhydride and adducts of maleic anhydride with cyclic diolefins, and 2) between 0.1 and 70%, based on the total weight of both reactants, of an organothiostannoic acid anhydride exhibiting the formula $(RSnS_{1.5})n$ wherein R represents an alkyl radical containing between 1 and 20 carbon atoms and n represents an integer between 2 and 5, inclusive.

4,120,876

PREPARATION OF MALEIC ANHYDRIDE FROM FOUR-CARBON HYDROCARBONS

Noel J. Bremer, Kent; James F. White, Akron, and Ernest C. Milberger, Solon, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed Oct. 19, 1976, Ser. No. 733,739
Int. Cl.[2] C07D *307/60*
U.S. Cl. 260—346.75 **13 Claims**

1. In a process for the preparation of maleic anhydride by the oxidation of n-butane, n-butenes, 1,3-butadiene or mixture thereof with molecular oxygen in the vapor phase at a reaction temperature of about 250° C. to 600° C. in the presence of a catalyst, the improvement comprising using as a catalyst a catalyst of the formula

$$X_aMo_{12}P_bAs_cO_x$$

wherein X is at least one element selected from the group consisting of Sn, rare earth metal, Zr, Rh, Mn, Re, Ru, Cu, Pb, Zn, Ti, Cr, Nb, Al, Ga, and alkaline earth metal; and wherein

a is a positive number less than about 20;
b and *c* are numbers from 0.001 to 10;
x is the number of oxygens required by the valence states of the other elements present.

4,120,877

OXIDATION OF OLEFINS TO OXIRANE COMPOUNDS WITH PERIODATE COMPOUNDS

William P. Coker, and Robert E. Lane, Jr., both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 19, 1977, Ser. No. 834,609
Int. Cl.[2] C07D *301/12*
U.S. Cl. 260—348.23 **16 Claims**

1. A process for forming an oxirane compound from a compound containing olefinic unsaturation which comprises contacting said compound containing olefinic unsaturation or a mixture thereof with a periodate represented by the formulas MIO_4, MH_4IO_6 and $M_2H_3IO_6$ or their hydrates, wherein M is a monovalent metal selected from lithium, sodium, potassium, rubidium, cesium, and silver or an ammonium group represented by the formula R_4N^+ wherein each R is independently a hydrocarbon group having from about 1 to about 8 carbon atoms, at a temperature, pressure and time sufficient to form said oxirane compound and thereafter recovering said oxirane compound.

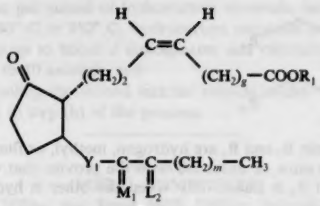
4,120,878

CIS-4,5-DIDEHYDRO-11-DEOXY-CIS-13-PGE$_1$ ANALOGS

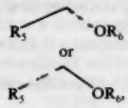
Ernest W. Yankee, 6828 Rothbury, Portage, Mich. 49081

Division of Ser. No. 595,869, Jul. 14, 1975, Pat. No. 4,026,909. This application Mar. 3, 1977, Ser. No. 774,084
Int. Cl.[2] C07C *177/00*
U.S. Cl. 260—408 **18 Claims**

1. A compound of the formula

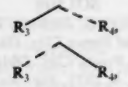


wherein Y_1 is cis-CH=CH—; wherein *g* is 2, 3, or 4; wherein M_1 is

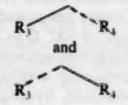


wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;

wherein L_2 is



or a mixture of

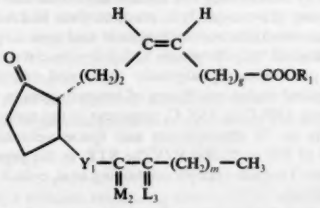


wherein R_3 and R_4 are hydrogen or fluoro, being the same or different, with the proviso that at least one of R_3 and R_4 is fluoro;

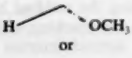
wherein *m* is one to 5, inclusive; and

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl or one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

12. A compound of the formula



wherein Y_1 is cis-CH=CH—; wherein *g* is 2, 3, or 4; wherein M_2 is



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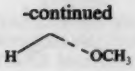
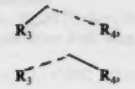
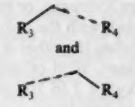


wherein L_3 is



or a mixture of



wherein R_3 and R_4 are hydrogen or methyl, being the same or different;

wherein *m* is one to 5, inclusive; and

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,120,879

13,14-DIHYDRO-9β-PGD$_2$ COMPOUNDS

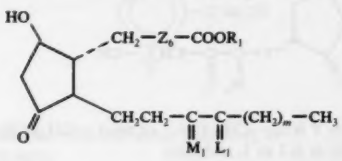
Douglas Ross Morton, Jr., Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 614,242, Sep. 17, 1975, Pat. No. 4,016,184. This application Dec. 30, 1976, Ser. No. 756,108

Int. Cl.[2] C07C *177/00*

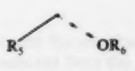
U.S. Cl. 260—408 **25 Claims**

1. A prostaglandin analog of the formula

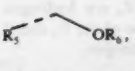


wherein *m* is one to 5, inclusive;

wherein M_1 is

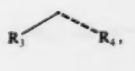


or



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;

wherein L_1 is



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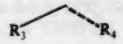
or a mixture of

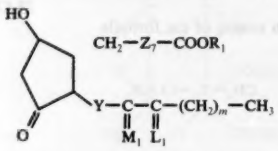


and

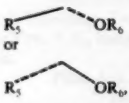
wherein R_3 and R_4 are hydrogen, or methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation; and
wherein Z_6 is
(1) cis-CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(2) cis-CH=CH—CH_2—$(CH_2)_g$—CH_2—, or
(3) cis-CH_2—CH=CH—$(CH_2)_g$—CH_2—,
wherein *g* is one, 2, or 3.

4,120,880
9β-PGD$_1$ COMPOUNDS
Douglas Ross Morton, Jr., Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
Division of Ser. No. 614,242, Sep. 17, 1975, Pat. No. 4,016,184. This application Dec. 30, 1976, Ser. No. 756,107
Int. Cl.^{2} C07C *177/00*
U.S. Cl. 260—408 **33 Claims**

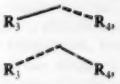
1. A prostaglandin analog of the formula



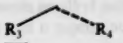
wherein Y is cis—CH=CH— or trans —CH=CH—;
wherein *m* is 1 to 5, inclusive;
wherein M_1 is



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of the R_5 and R_6 is methyl only when the other is hydrogen;
wherein L_1 is



or a mixture of



and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation; and
wherein Z_7 is

(1) —$(CH_2)_3$—$(CH_2)_g$—CF_2—CF_2—, or

(2) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,
wherein *g* is 1, 2, or 3.

4,120,881
PREDOMINANTLY ALIPHATIC LOWER HYDROCARBON MATERIALS FROM CARBONACEOUS SOLIDS
Charles M. Starks; Robert G. Jackson; David V. Porchey, and Dennis J. Royer, all of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.
Filed Jan. 9, 1975, Ser. No. 539,679
Int. Cl.^{2} C07C *27/06*
U.S. Cl. 260—449.6 R **7 Claims**

1. A process comprising:
(a) gasifying carbonaceous solids with from about 0.1 to about 3 pounds of steam per pound of said solids at temperatures in the range of 500° C to 2,100° C and pressures of atmospheric to 1,000 atmospheres to form a gasification product stream containing a mixture of water, carbon dioxide, carbon monoxide, hydrogen, sulfur compounds and hydrocarbon materials of a predominantly aliphatic type,
(b) combining the gasification product stream with first and second internal recycle streams rich in hydrocarbon materials of a predominantly aliphatic type to form a crude product stream,
(c) removing water, carbon dioxide and sulfur compounds from the crude product stream to form a purified product stream containing essentially only hydrocarbon materials, carbon monoxide and hydrogen,
(d) cooling the purified product stream to liquefy and separate the hydrocarbon materials from the carbon monoxide and hydrogen,
(e) directly introducing the carbon monoxide and hydrogen from step (d) to a catalytic reaction zone and reacting the carbon monoxide and hydrogen in said zone to produce a first internal recycle stream rich in hydrocarbon materials of a predominantly aliphatic type, said reaction being conducted under conditions of temperatures in the range of about 150° C to 450° C, pressures in the range of atmospheric to 75 atmospheres and space velocities in the range of 500 to 50,000 V/V/hr STP, in the presence of a Fischer-Tropsch catalyst containing iron, cobalt, nickel or ruthenium,
(f) recycling the first internal recycle stream of step (e) back to step (b) of the process,
(g) fractionally separating the hydrocarbon materials of step (d) into product hydrocarbon materials and residual higher hydrocarbon materials,
(h) directly introducing the residual hydrocarbon materials to a cracking zone and cracking said hydrocarbon materials to produce a second internal recycle stream, said

cracking being carried out using about 0.2 to 1.5 pounds of steam per pound of hydrocarbon materials, temperatures of 750° C to 950° C, hydrocarbon materials partial pressures up to about 2 atmospheres and residence times of 0.01 to 10 seconds, and

(i) recycling the second internal recycle stream of step (h) back to step (b) of the process.

4,120,882
METAL COMPLEXES

Günther Wilke, and Ernst Willi Müller, both of Mulheim, Germany, assignors to Studiengesellschaft Koble m.b.H., Mulheim, Germany

Continuation of Ser. No. 692,167, Jun. 2, 1976, abandoned, which is a division of Ser. No. 573,198, Apr. 30, 1975, Pat. No. 4,017,526, which is a continuation of Ser. No. 532,900, Mar. 9, 1966, abandoned, which is a division of Ser. No. 104,221, Apr. 20, 1961, abandoned, which is a continuation-in-part of Ser. No. 76,520, Dec. 19, 1960, abandoned, and Ser. No. 203,753, Jun. 20, 1962, abandoned. This application May 18, 1977, Ser. No. 798,199

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1959, 15930; Apr. 28, 1960, 16427; Jun. 30, 1971, 18017

Int. Cl.[2] C07F *15/04, 15/06*

U.S. Cl. 260—439 R **11 Claims**

1. As a novel complex compound, $Ni(P(C_6H_5)_3)_4$ comprising tetrakis(triphenylphosphine)nickel in the form of red-brown crystals.

4,120,883
METHOD FOR PRODUCING AN ORGANOMAGNESIUM COMPLEX

Hisaya Sakurai; Hideo Morita; Tadashi Ikegami; Katsuaki Maeda, and Masayasu Furusato, all of Okayamaken, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 13, 1976, Ser. No. 750,303

Claims priority, application Japan, Dec. 22, 1975, 50-151833; Apr. 12, 1976, 51-40339; Apr. 14, 1976, 51-41245

Int. Cl.[2] C07F *5/06*

U.S. Cl. 260—448 A **10 Claims**

1. A method for producing a hydrocarbon-soluble organomagnesium complex of the formula

$$Mg_\alpha Al_\beta R^1_p Y_q$$

wherein

α, β, p and q each is a number greater than zero,

α/β = about 0.5 to 20,

2α and $3\beta = p + q$,

q/β = about 0.5 to 1.5,

Y is OR^2 or $OSiR^3R^4R^5$,

R^1, R^2 and R^3 each independently is a hydrocarbon radical having 1 to 20 carbon atoms, and

R^4 and R^5 each independently is a hydrocarbon radical having 1 to 20 carbon atoms, hydrogen or a halogen atom, which comprises reacting in an inert hydrocarbon medium at a temperature of about 50°–150° C. and for about 0.5 to 20 hours

(A) an ether-free solution containing about 0.1-2.5 mols per liter of organomagnesium compound of the formula

$$R^1_\alpha MgX_{2-\alpha}$$

with (B) a solution containing about 0.005-5 mols per liter of an aluminum compound of the formula

$$AlYX_2$$

wherein

X is a halogen atom, and

a is a positive number up to 2.

4,120,884
STORAGE-STABLE, LIQUID POLYISOCYANATES POSSESSING CARBODIIMIDE GROUPS, AND PROCESS FOR THEIR MANUFACTURE

Frank Peter Woerner, Mutterstadt; Peter T. Kan, Ludwigshafen, and Georg Falkenstein, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 28, 1977, Ser. No. 763,647

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1976, 2606419

Int. Cl.[2] C07C *119/055*

U.S. Cl. 260—453 SP **8 Claims**

1. An improved storage-stable, liquid polyisocyanate possessing carbodiimide groups, which contains from about 25 to about 35% by weight, based on the total weight, of NCO groups, obtained by condensing a polyisocyanate in the presence of a catalyst selected from the group consisting of phospholine, phospholidine, phospholine oxide and phospholidine oxide wherein the improvement consists in that condensation has been stopped and the condensation product stabilized by a stopper selected from the group consisting of iron (III) chloride, benzoyl chloride, methyl-p-toluenesulfonate and dimethylsulfate.

4,120,885
ETHYNYLBENZENE COMPOUNDS AND DERIVATIVES THEREOF

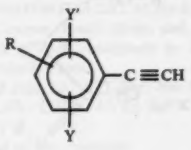
Julius Diamond, Morris Plains, N.J., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 574,837, May 14, 1975, which is a continuation of Ser. No. 431,254, Jan. 7, 1974, Pat. No. 3,923,910. This application Nov. 23, 1976, Ser. No. 744,330

Int. Cl.[2] C07C *153/09, 149/28, 161/00*

U.S. Cl. 260—455 R **10 Claims**

1. A compound of the formula



where

R is selected from the group consisting of
hydrogen,
alkyl,
cycloalkyl,
alkylcycloalkyl,
cycloalkenyl,
aryl or
substituted aryl where the substituent is Y'';

Y and Y' are each selected from the group consisting of
hydrogen,
mercapto,
acylthio,
loweralkylthio,
loweralkylsulfinyl and
loweralkylsulfonyl,

Y'' is selected from the group consisting of
Y,
loweralkyl,
trifluoromethyl and
halo,

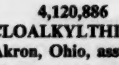
with the proviso that at least one of Y and Y' is other than hydrogen.

4,120,886
S-ARYL N-CYCLOALKYLTHIOLCARBAMATES

Jay Kent Rinehart, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 701,382, Jun. 30, 1976, Pat. No. 4,055,656.
This application Oct. 17, 1977, Ser. No. 842,818
Int. Cl.[2] C07C *153/09*; A01N *9/12*
U.S. Cl. 260—455 A 3 Claims

1. A composition represented by the general formula:



wherein:

Ar is an aryl selected from the group consisting of 4-methoxyphenyl, 4-ethoxyphenyl, 4-isopropoxyphenyl, and 4-tert-butoxyphenyl; and

R is cyclohexyl or cyclopropyl.

4,120,887
LUBRICATING OIL ADDITIVE, PROCESS FOR THE SYNTHESIS THEREOF AND LUBRICATING OIL ADDITIVE COMPOSITION

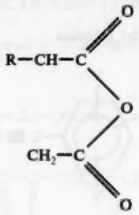
Nobukazu Okamoto, Saitama, Japan, assignor to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 714,320, Nov. 28, 1972, Pat. No. 4,071,548, which is a division of Ser. No. 310,095, Nov. 28, 1972, Pat. No. 3,991,098. This application Nov. 21, 1977, Ser. No. 853,246
Claims priority, application Japan, Nov. 30, 1971, 46/96580; Nov. 30, 1971, 46/96581
Int. Cl.[2] C07F *5/04*
U.S. Cl. 260—462 R 3 Claims

2. A lubricating oil additive composition comprising a reaction product obtained by

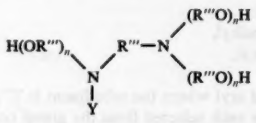
I. reacting

A. an alkyl- or alkenylsuccinic anhydride of the formula



wherein R is alkyl or alkenyl having from 40 to 200 carbon atoms, with

B. a compound of the formula



wherein R‴ is ethylene or propylene, and n is a number from 3 to 8

at a molar ratio of A:B in the range of 1:1 to 1:0.1,

at a temperature in the range of from 150° to 220° C.,

until the infared absorptions for $\nu_{C=O}$ at 1870cm^{-1} and 1790cm^{-1} disappear, an infrared absorption for $\nu_{C=O}$ is present at 1750cm^{-1} and an infrared absorption for ν_{OH} is present at about 3450cm^{-1}, and

II. reacting the product of step I with boric acid or boric acid anhydride at a molar ratio of from 0.3 to one mole of boric acid or boric acid anhydride per one mole of A, under reduced pressure, at a temperature of 100° to 200° C. until the infrared absorption for ν_{OH} at about 3450cm^{-1} disappears and no turbidity or precipitate appears when the reaction mixture is dissolved in n-pentane and is cooled.

3. A composition as claimed in claim 2 in which between step I and step II, the reaction product of step I is reacted with

C. a secondary alkanol amine of the formula

$$NH(R''' OH)_2$$

wherein R‴ is as defined above,

at a molar ratio of the reaction product of step I:C in the range of from 1:0.3 to 1:1, under reduced pressure, at a temperature in the range of from 150° to 200° C., until infrared absorptions are present for $\nu_{C=O}$ at 1750cm^{-1} and 1650cm^{-1}, an infrared absorption is present for ν_{OH} at about 3450cm^{-1} and no turbidity is observed when the reaction mixture is dissolved in n-pentane and is cooled.

4,120,888
PREPARATION OF CHLORINE-SUBSTITUTED CHLOROFORMATES

Franklin Anderson Bolth, Baltimore, Md., assignor to Minerec Corporation, New York, N.Y.

Filed Jan. 26, 1978, Ser. No. 872,573
Int. Cl.[2] C07C *68/02*
U.S. Cl. 260—463 7 Claims

1. A continuous process for the production of chlorine-substituted chloroformates from phosgene and 1–2 epoxy ring compounds comprising;

establishing a circulating stream of said chloroformate;

passing said stream through a catalyst bed of activated carbon;

injecting said phosgene and an epoxy compound selected from the group consisting of propylene epoxide, ethylene epoxide, allyl glycidal ether and phenyl glycidal ether into said stream ahead of said catalyst; and

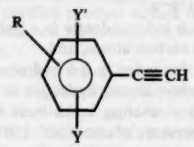
drawing off chloroformate as product.

4,120,889
CYANO ETHYNYLBENZENE COMPOUNDS

Julius Diamond, Morris Plains, N.J., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 574,837, May 14, 1975, which is a continuation of Ser. No. 431,254, Jan. 7, 1974, Pat. No. 3,923,910, which is a division of Ser. No. 268,419, Jul. 3, 1972, Pat. No. 3,852,364. This application Nov. 23, 1976, Ser. No. 744,333
Int. Cl.[2] C07C *121/52*, *121/60*
U.S. Cl. 260—465 K 7 Claims

1. A compound of the formula



where

R is

alkyl of 3 to 7 carbon atoms,

cycloalkyl of 5 to 7 carbon atoms,

1 to 7 carbon atoms alkyl-substituted cycloalkyl of 5 to 7 carbon atoms,

cycloalkenyl of 5 to 7 carbon atoms,

phenyl or

substituted phenyl where the substituent is Y″;

Y and Y′ are each selected from the group consisting of hydrogen and

cyano;

Y″ is selected from the group consisting of

Y,
lower alkyl of 1 to 7 carbon atoms,
trifluoromethyl and
halo,
with the proviso that at least one of Y and Y′ is other than hydrogen.

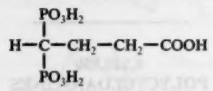
4,120,890

DIPHOSPHONOALKANE CARBOXYLIC ACIDS, PROCESS OF PREPARATION AND METHODS OF USE

Helmut Blum, and Karl-Heinz Worms, both of Dusseldorf, Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Germany

Division of Ser. No. 761,271, Jan. 21, 1977, Pat. No. 4,077,997. This application Sep. 14, 1977, Ser. No. 833,143
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1976, 2602030
Int. Cl.² C07F 9/38; A61K 7/16
U.S. Cl. 260—502.4 P 2 Claims

1. A diphosphonoalkane carboxylic acid selected from the group consisting of (A) a compound of the formula



and (B) a non-toxic, pharmacologically acceptable water-soluble salt thereof.

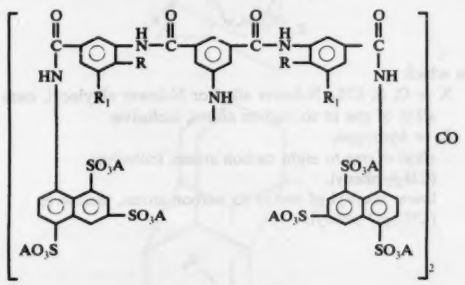
4,120,891

UREYLENE NAPHTHALENE SULFONIC ACIDS

John Frank Poletto, Nanuet, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 1, 1977, Ser. No. 812,192
Int. Cl.² C07C 143/30; A61K 31/185
U.S. Cl. 260—506 6 Claims

1. A compound of the formula:



wherein R is selected from the group consisting of hydrogen and methyl; R_1 is selected from the group consisting of hydrogen and carboxyl; A is a pharmaceutically acceptable salt cation.

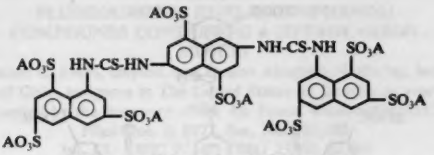
4,120,892

ANIONIC NAPHTHALENE THIOUREIDO NAPHTHALENE SULFONIC ACIDS

John Frank Poletto, Nanuet; Ransom Brown Conrow, Pearl River, and Seymour Bernstein, New City, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 5, 1977, Ser. No. 813,059
Int. Cl.² C07C 143/30; A61K 31/185
U.S. Cl. 260—506 2 Claims

1. A compound of the formula:



wherein A is a pharmaceutically acceptable salt cation.

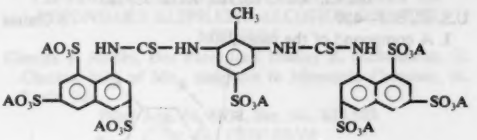
4,120,893

ANIONIC NAPHTHALENE THIOUREIDO TOLUENESULFONIC ACIDS

John Frank Poletto, Nanuet; Ransom Brown Conrow, Pearl River, and Seymour Bernstein, New City, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 29, 1977, Ser. No. 811,102
Int. Cl.² C07C 143/30; A61K 31/185
U.S. Cl. 260—506 2 Claims

1. A compound of the formula:



wherein A is a pharmaceutically acceptable salt cation.

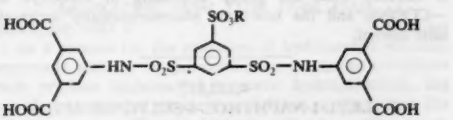
4,120,894

SULFO-M-PHENYLENEBIS(SULFONYLIMINO)-DIISOPHTHALIC ACID SALTS

Ransom Brown Conrow, Pearl River, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 13, 1977, Ser. No. 805,771
Int. Cl.² C07C 143/52; A61K 31/19
U.S. Cl. 260—507 R 2 Claims

1. A compound of the formula:



wherein R is selected from the group consisting of alkali metal; and the pharmaceutically acceptable salts thereof.

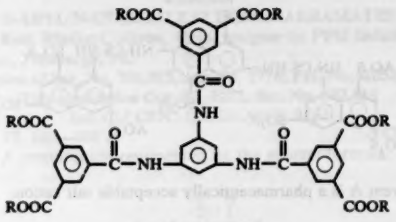
4,120,895

S-PHENENYLTRIS (IMINOCARBONYL) TRIISOPHTHALIC ACID SALTS

Ransom Brown Conrow, Pearl River; John Frank Poletto, Nanuet, and Seymour Bernstein, New City, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 29, 1977, Ser. No. 811,098
Int. Cl.² C07C 63/32, 69/76
U.S. Cl. 562—457 1 Claim

1. A compound of the formula:



wherein R is selected from the group consisting of alkali metal; and the pharmaceutically acceptable salts thereof.

4,120,896

S-PHENENYLTRIS(SULFONYLIMINO)TRI-ANIONIC SUBSTITUTED BENZENE DICARBOXYLIC ACIDS AND SUBSTITUTED ALKYL AMINO ACIDS AND THEIR SALTS

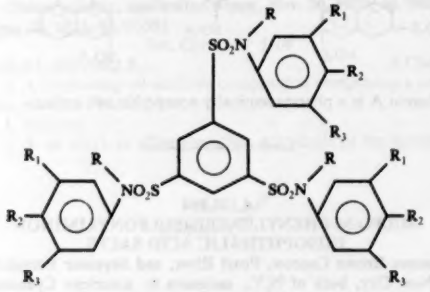
Ransom Brown Conrow, Pearl River, and Seymour Bernstein, New City, both of N.Y., assignors to America Cyanamid Company, Stamford, Conn.

Filed Jun. 13, 1977, Ser. No. 805,774

Int. Cl.[2] C07C *101/68;* A61K *31/195*

U.S. Cl. 562—430 **5 Claims**

1. A compound of the formula:



wherein R is selected from the group consisting of hydrogen, sodium and C_1–C_6 alkyl; R_1 is selected from the group consisting of hydrogen, carboxyl, and —COONa; R_2 is selected from the group consisting of hydrogen, carboxyl and —COONa; R_3 is selected from the group consisting of carboxyl, and —COONa; and the non-toxic pharmaceutically acceptable salts thereof.

4,120,897

2-ALKYL-1-NAPHTHOL-4-SULFONIC ACIDS

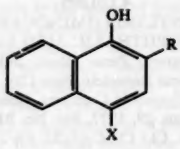
Gregory Wayne Schwing, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 672,724, Apr. 1, 1976, Pat. No. 4,049,705. This application Jun. 14, 1977, Ser. No. 806,516

Int. Cl.[2] C07C *143/70*

U.S. Cl. 260—543 R **2 Claims**

1. A compound of the formula



wherein

R is alkyl of 11 to 14 carbon atoms, and

X is $—SO_2Cl$.

4,120,898

SULFUR CONTAINING VINYL AMIDE CROSS-LINKING AGENTS

Norman Alfred Smith, Hornchurch, and Rainer Kitzing, Ingatestone, both of England, assignors to Ciba-Geigy AG, Basel, Switzerland

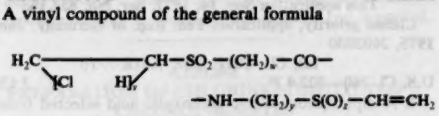
Filed Jan. 18, 1977, Ser. No. 760,291

Claims priority, application United Kingdom, Feb. 4, 1976, 4281/76

Int. Cl.[2] C07C *103/38, 103/60;* G03C *1/30*

U.S. Cl. 260—561 S **3 Claims**

1. A vinyl compound of the general formula



wherein *v* is 0 or 1, *w* is 2 or 3 *y* is 2 to 6 and *z* is 1 or 2.

4,120,899

POLYCYCLOANILINES

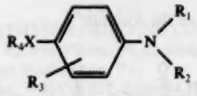
Daniel Lednicer, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 576,342, May 12, 1975, Pat. No. 4,036,977, which is a continuation-in-part of Ser. No. 507,462, Sep. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 416,402, Nov. 16, 1973, abandoned. This application May 26, 1977, Ser. No. 800,800

Int. Cl.[2] C07C *103/127*

U.S. Cl. 260—562 R **18 Claims**

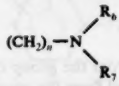
1. A compound of the formula



in which

X = O, S, CH_2, N-lower alkyl or N-lower alkylacyl, each alkyl of one to six carbon atoms, inclusive;

R_1 = hydrogen,
alkyl of one to eight carbon atoms, inclusive;
$(CH_2)_n$-phenyl,
lower alkynyl of one to six carbon atoms, inclusive;
$(CH_2)_n$-O-phenyl,



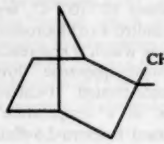
in which R_6 and R_7 is lower alkyl of one to six carbon atoms, inclusive, or $(CH_2)_n$ OH;
n = 1, 2, or 3;

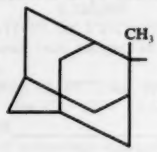
R_2 = lower alkyl acyl of one to six carbon atoms, inclusive;

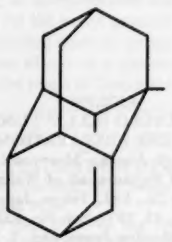
R_3 = hydrogen,
halogen,
methyl,
2,6-dimethyl,
3,5-dimethyl,
—CHO,
$—CH_2OH$,
$—CH(CH_3)OH$,
$—CH_2SCH_3$,

R_1 and R_2 as defined above

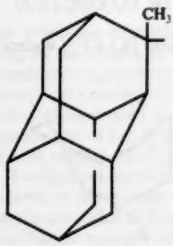
R_4 is a bridged polycyclic hydrocarbon attached through a tertiary carbon atom, said R_4 of the formulae







or



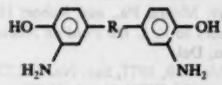
and pharmacologically acceptable acid addition salts.

4,120,900
FLUOROCARBON BIS(O-AMINOPHENOL) COMPOUNDS CONTAINING A HYDROCARBON MOIETY

Robert C. Evers, Dayton, and Tonson Abraham, Kettering, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 1, 1977, Ser. No. 856,385
Int. Cl.[2] C07C *91/44*; C08G *23/00, 65/40*
U.S. Cl. 260—571 **3 Claims**

1. A bis(o-aminophenol) compound having the following structural formula:



where R_f is $(CF_2)_3$—$(CH_2)_2$—$(CF_2)_3$ or $(CF_2)_3CH{=}CH(CF_2)_3$.

4,120,901
PRODUCTION OF PRIMARY AND SECONDARY AMINES BY REACTION OF AMMONIA WITH CONJUGATED DIENE IN THE PRESENCE OF PD/PHOSPHINE CATALYST AND PRIMARY OR SECONDARY ALIPHATIC ALCOHOL SOLVENT MEDIUM

Charles F. Hobbs, Des Peres, and Dudley E. McMackins, St. Charles, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 31, 1977, Ser. No. 829,558
Int. Cl.[2] C07C *85/18*
U.S. Cl. 260—585 D **9 Claims**

1. The process of reacting ammonia with a conjugated diene having from 4 to 8 carbon atoms in a solvent reaction medium consisting essentially of one or more alcohols selected from the group consisting of primary and secondary aliphatic alcohols and in the presence of a catalyst system consisting essentially of a palladium compound with a phosphine ligand containing from 2 to 4 phosphorus atoms to thereby produce an unsaturated amine product selected from the group consisting of secondary and primary amines.

4,120,902
OXIDATION PRODUCT RECOVERY

Yulin Wu, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 7, 1977, Ser. No. 775,144
Int. Cl.[2] C07C *27/04, 27/34, 37/08, 45/24*
U.S. Cl. 260—586 R **8 Claims**

1. In a process for the oxidation of hydrocarbyl aromatic compounds with an oxygen-containing gas under conditions which produce hydrocarbyl aromatic hydroperoxides, the steps of separating and recovering oxidation products from the oxidation reaction effluent which comprises:

(a) contacting the oxidation reaction effluent comprising hydrocarbyl aromatic hydroperoxide and unoxidized hydrocarbyl aromatic reactants with an alcohol-base-water solvent mixture under extraction conditions which form a first aqueous hydrocarbyl aromatic hydroperoxide phase also containing alcohol and base and residual amounts of unoxidized hydrocarbyl aromatic and a hydrocarbyl aromatic phase and separating said first aqueous phase from said aromatic phase;

(b) extracting said residual amounts of unoxidized hydrocarbyl aromatic solvent under extraction conditions such that said paraffin hydrocarbon extracts said residual unoxidized hydrocarbyl aromatic leaving a second aqueous phase comprising hydrocarbyl aromatic hydroperoxide base and alcohol;

(c) subjecting said second aqueous phase remaining in (b) to solvent extraction by contacting with an aromatic solvent

under extraction conditions which form an extract phase containing aromatic solvent, hydrocarbyl aromatic hydroperoxide, and residual amounts of base and a third aqueous phase and separating said extract phase from said third aqueous phase; and

(d) washing said extract phase with water to remove residual amounts of base leaving a purified phase of aromatic solvent and hydrocarbyl aromatic hydroperoxide.

4,120,903

METHOD FOR PREPARING POLY(TETRAMETHYLENE ETHER) GLYCOL

Gerfried Pruckmayr, Media, Pa., and Robert H. Weir, Nashville, Ind., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 30, 1977, Ser. No. 782,735
Int. Cl.[2] C07C *41/02, 41/00*
U.S. Cl. 260—615 B 4 Claims

1. In a process for preparing poly(tetramethylene ether) glycol by polymerizing tetrahydrofuran using water or 1,4-butanediol as a chain terminator, the improvement comprising using as a catalyst a polymer of monoethylenically unsaturated monomers, the polymer being effectively free of functional groups which interfere with the polymerization and containing groups of the formula

or

where

⋯⋯ represents the polymer chain or a segment thereof;

D is hydrogen, an aliphatic or aromatic hydrocarbon radical of 1 to 10 carbon atoms, a halogen or a segment of the polymer chain;

X and Y are hydrogen, an aliphatic or aromatic hydrocarbon radical of 1 to 10 carbon atoms, or fluorine, but at least one of X and Y must be fluorine;

R is a linear or branched linking group having up to 40 carbon atoms in the principal chain; and

Z is hydrogen, an aliphatic or aromatic hydrocarbon radical of 1 to 10 carbon atoms, or halogen.

4,120,904

SYNTHESIS OF FLUOROTRINITROMETHANE

Donald Pilipovich, Agoura; Louis R. Grant, Jr., Los Angeles, and Richard D. Wilson, Canoga Park, all of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 26, 1977, Ser. No. 801,453
Int. Cl.[2] C07C *79/12*
U.S. Cl. 260—644 10 Claims

1. In a process for preparing fluorotrinitromethane in which tetranitromethane is reacted in an aprotic solvent with a complex having the following formula:

$MOCF(CF_{3-x}Cl_x)_2$, wherein M is an alkali metal and x is zero to 2, inclusive, the improvement which comprises conducting the reaction in the presence of chlorine or bromine.

4,120,905

REMOVAL OF NITROSATING AGENTS

William N. Cannon, Cumberland, and Richard F. Eizember, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 21, 1977, Ser. No. 835,087
Int. Cl.[2] C07C *79/12*
U.S. Cl. 260—646 10 Claims

1. A process for lowering the concentration of nitrosating agents in 1-chloro-2,6-dinitro-4-(trifluoromethyl)benzene which comprises

(1) bubbling a gas which is non-reactive with 1-chloro-2,6-dinitro-4-(trifluoromethyl)benzene through a mixture of (a) 1-chloro-2,6-dinitro-4-(trifluoromethyl)benzene containing nitrosating agents and (b) an aqueous solution of a base which is

(a) sodium carbonate,
(b) potassium carbonate,
(c) sodium hydroxide, or
(d) potassium hydroxide,

at a temperature of about 50°–100° C., until the concentration of nitrosating agents is lowered; or

(2) contacting 1-chloro-2,6-dinitro-4-(trifluoromethyl)benzene containing nitrosating agents with an aqueous solution of a base which is

(a) sodium carbonate,
(b) potassium carbonate,
(c) sodium hydroxide, or
(d) potassium hydroxide,

at a temperature of about 50°–100° C., separating the once-treated 1-chloro-2,6-dinitro-4-(trifluoromethyl)benzene, and thereafter bubbling a gas which is non-reactive with 1-chloro-2,6-dinitro-4-(trifluoromethyl)benzene through an aqueous mixture of the once-treated 1-chloro-2,6-dinitro-4-(trifluoromethyl)-benzene, at a temperature of 50°–100° C., whereby there is obtained 1-chloro-2,6-dinitro-4-(trifluoromethyl)benzene characterized by a lowered concentration of nitrosating agents.

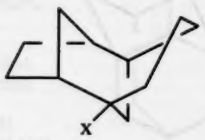
4,120,906

1-HALOGENOTRICYCLO [4.3.1.1^{2,5}] UNDECANE AND PROCESS FOR THE PREPARATION THEREOF

Yoshiaki Inamoto; Koji Aigami; Motoyoshi Ohsugi; Hiroshi Ikeda, and Yoshiaki Fujikura, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1977, Ser. No. 833,679
Claims priority, application Japan, Oct. 7, 1976, 51-120983
Int. Cl.[2] C07C *17/20*
U.S. Cl. 260—648 C 8 Claims

1. 1-Halogenotricyclo [4.3.1.1^{2,5}] undecane having the formula (I):



(I)

wherein X is chloro or bromo.

4,120,907

BIS(μ-DIPHENYLPHOSPHIDO)TRIS(TRIETHYLPHOSPHINE)DINICKEL OLIGOMERIZATION OF 1,3 BUTADIENE

Darryl R. Fahey, and John E. Mahan, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 684,350, May 7, 1976. This application Dec. 8, 1977, Ser. No. 858,598

Int. Cl.[2] C07C *13/26, 13/27*

U.S. Cl. 260—666 B 3 Claims

1. A process for oligomerizing at least one conjugated diene having 4 to 7 carbon atoms per molecule comprising contacting said at least one conjugated diene with a catalyzing amount of bis(μ-diphenylphosphido)tris(triethylphosphine)dinickel in a suitable diluent under suitable reaction conditions.

4,120,908

PROCESS FOR THE CONVERSION OF C_8 AROMATIC HYDROCARBONS

Setsuo Kamiyama; Katsumi Kaneko, both of Ooi; Yukio Nagashima, Wako; Hiroshi Furukawa, Ooi, and Shozo Wada, Zushi, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 18, 1977, Ser. No. 797,992

Claims priority, application Japan, Jun. 4, 1976, 51-64564

Int. Cl.[2] C07C *15/08*

U.S. Cl. 260—668 A 10 Claims

1. A process for the conversion of C_8 aromatic hydrocarbons to isomerize xylenes present which comprises contacting a mixture of C_8 aromatic hydrocarbons with an acid leached hydrogen form mordenite catalyst having a silica (SiO_2) to alumina (Al_2O_3) molar ratio of 15 to 21 at a temperature of 180° to 250° C. under a pressure of atmospheric to 200 Kg/cm^2.

4,120,909

PREPARATION OF ETHYNYLBENZENES

Ali Amirnazmi, Tehran, Iran, assignor to Hercules Incorporated, Wilmington, Del.

Filed Aug. 11, 1977, Ser. No. 823,882

Int. Cl.[2] C07C *15/09*

U.S. Cl. 260—668 R 9 Claims

1. The process of preparing ethynylbenzenes which comprises contacting an acetylbenzene unsubstituted in the benzene ring except for the acetyl group(s) with an alumina-containing catalyst selected from the group consisting of alumina, a natural aluminum silicate or a synthetic aluminum silicate at a temperature in the range of from about 500° to about 650° C.

4,120,910

AROMATIZATION OF ETHANE

Pochen Chu, West Deptford, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,217

Int. Cl.[2] C07C *15/02;* C01B *29/28;* C01G *9/04*

U.S. Cl. 260—673 8 Claims

1. A process for producing aromatic compounds which comprises contacting, in the absence of added air or oxygen under conversion conditions, a gaseous paraffinic hydrocarbon feed containing ethane, with a catalyst comprising a crystalline aluminosilicate zeolite characterized by a constraint index within the approximate range of 1 to 12 and a silica to alumina ratio of at least 12, said catalyst having incorporated therein from about 0.01 to 30 weight percent based on the total weight of the catalyst of a metal or metal oxide wherein said metal is selected from the group consisting of Group VIII, IIB and IB metals and mixtures thereof whereby ethane present in said gaseous feed is converted to aromatic compounds and recovering said aromatic compounds as liquids.

4,120,911

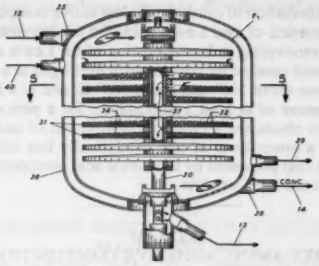
METHOD FOR CONCENTRATING A SLURRY CONTAINING A SOLID PARTICULATE COMPONENT

James Melvin Davidson, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 204,010, Dec. 2, 1971, abandoned, which is a continuation-in-part of Ser. No. 163,527, Jul. 2, 1971, abandoned. This application Dec. 26, 1973, Ser. No. 427,869

Int. Cl.[2] C07C *7/14*

U.S. Cl. 260—674 A 20 Claims



1. A process for increasing the concentration of a slurry comprising a particulate solid in a carrier liquid, which comprises removing a portion of said liquid from the slurry by:

(1) introducing the slurry into a filtration zone containing a rotating unit, said unit containing a filter assembly adapted to pass said liquid as a filtrate while screening out said solid;

(2) collecting said filtrate in a chamber in said assembly by maintaining a pressure differential between said slurry in said zone and said filtrate in said chamber;

(3) withdrawing the filtrate from said chamber; and

(4) withdrawing the resulting concentrated slurry from said zone;

wherein said solid had a sensity greater than that of said carrier liquid, and wherein said unit is rotated at a velocity sufficient to generate a centrifugal force in the range from about 10 to 100 gravitational units and wherein substantially only centrifugal force is used to displace solids from said filter assembly.

10. A method for increasing the concentration of a slurry comprising solid p-xylene in a carrier liquid, which comprises removing a portion of said liquid from the slurry by:

(1) introducing the slurry into a filtration zone containing a rotating unit, said unit containing a filter assembly adapted to pass said liquid as a filtrate while screening out said solid p-xylene;

(2) collecting said filtrate in a chamber in said assembly by maintaining a pressure differential between said slurry in said zone and said filtrate in said chamber;

(3) withdrawing the filtrate from said chamber; and

(4) withdrawing the resulting concentrated slurry from said zone;

wherein said unit is rotated at a velocity sufficient to generate a centrifugal force in the range from about 10 to 100 gravitational units and wherein substantially only centrifugal force is used to displace solids from said filter assembly.

4,120,912
RECOVERY OF LEWIS ACID/BRONSTED ACID CATALYST WITH HYDROGEN AT ELEVATED TEMPERATURES AND PRESSURES

Roger Hulme, Somerville, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

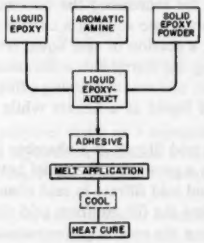
Continuation-in-part of Ser. No. 628,589, Nov. 4, 1975, abandoned. This application Jul. 5, 1977, Ser. No. 812,635
Int. Cl.[2] C07C *3/54, 3/56, 5/28*
U.S. Cl. 260—683.47 **27 Claims**

1. In a hydrocarbon conversion process which comprises contacting a hydrocarbon feedstock with a substantially liquid phase catalyst comprising (a) one or more Lewis acids selected from the group consisting of the fluorides, chlorides and bromides of tantalum(V), niobium(V) and mixtures thereof and at least an equal molar amount of (b) a strong Bronsted acid, thereby forming a hydrocarbon phase and a catalyst phase, said catalyst phase having become at least partially deactivated due to the formation of catalytically less active complexes with at least a portion of said Lewis acid, the improvement which comprises recovering at least a portion of the Lewis acid component of said catalyst by contact with hydrogen at a temperature between about 100° and about 500° C. and at a hydrogen partial pressure of at least 1 atmosphere for a period of time sufficient to obtain the Lewis acid component of said catalyst possessing a lower level of said catalytically less active complexes than that possessed by the Lewis acid component of said partially deactivated catalyst.

4,120,913
EPOXY-AMINE ADHESIVE COMPOSITIONS

Edward M. Petrie, Wilkinsburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 10, 1976, Ser. No. 749,593
Int. Cl.[2] C08L *63/00*
U.S. Cl. 260—830 TW **9 Claims**



1. A method of making an adhesive composition comprising the steps of:

(1) admixing, at a temperature of up to about 40° C.:

(A) 1 part by weight of a liquid mixture consisting of a liquid epoxy resin, having a viscosity of from about 500 cps. to about 22,500 cps. at 25° C., selected from the group consisting of diglycidyl ethers of bisphenol A epoxy resins, diglycidyl ethers of bisphenol F epoxy resins and mixtures thereof, and about 0.20 part by weight to about 1.5 parts by weight of an amine selected from the group consisting of liquid aromatic diamines and liquefied solid aromatic diamines, to provide a stoichiometric excess of amine; with

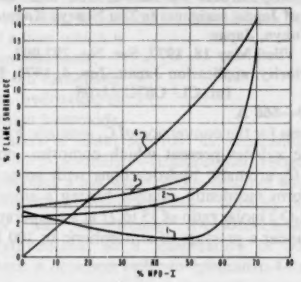
(B) a solid epoxy resin powder, selected from the group consisting of diglycidyl ethers of bisphenol A epoxy resins, diglycidyl ethers of bisphenol F epoxy resins, novolac epoxy resins and mixtures thereof, having a melting point of between about 55° C. to about 225° C. and an average particle size of between about 10 microns to about 420 microns; and

(2) maintaining a temperature for the admixture of up to about 40° C., said temperature being effective to permit the liquid epoxy resin and the amine to react to form a solid reaction product adduct and effective to allow the solid epoxy resin powder to remain unreacted, wherein a stable, solid two phase system of dispersed epoxy powder and adduct is formed, where the weight ratio of solid epoxy resin powder:adduct is from about 1 to 6:1, and the melting point of the adduct is within about 1° C. to about 50° C. of the melting point of the epoxy resin powder.

4,120,914
AROMATIC POLYAMIDE FIBER BLEND FOR PROTECTIVE CLOTHING

Wallace Peery Behnke, Newark; Robert Stuart Chapin, and John Francis Fierro, both of Wilmington, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 4, 1977, Ser. No. 765,751
Int. Cl.[2] C08L *77/10*
U.S. Cl. 260—857 TW **5 Claims**



1. An intimate blend of aromatic polyamide staple fiber components comprising 45–55 weight percent poly(m-phenylene isophthalamide) fibers and 45–55 weight percent poly(p-phenylene terephthalamide) fibers whose stress-strain curve exhibits no yield point.

4,120,915
STYRENE-DIENE$_1$-DIENE$_2$ BLOCK TERPOLYMER WITH IMPROVED THERMAL STABILITY

Lawrence M. Fodor, and Alonzo G. Kitchen, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 12, 1976, Ser. No. 704,589
Int. Cl.[2] C08F *297/04*
U.S. Cl. 260—880 B **12 Claims**

1. A process for producing an antioxidant-containing thermally stable resinous polymer of styrene, 1,3-butadiene and isoprene, said polymer having 70–95 weight percent of said styrene based on a total weight of said styrene, butadiene, and isoprene, said isoprene being present in an amount within the range of 2–15 parts per 100 parts of said styrene, butadiene, and isoprene, said process comprising:

(1) forming said polymer by contacting said styrene with an organolithium initiator under polymerization conditions and effecting polymerization thereof; thereafter sequentially adding and polymerizing said isoprene and said 1,3-butadiene; and thereafter introducing a polyfunctional coupling agent to form a coupling polymer;

(2) adding the antioxidant to the coupled polymer; and

(3) recovering the coupled polymer.

4,120,916
AMORPHOUS AND CRYSTALLINE POLYOLEFIN BASED HOT-MELT ADHESIVE

Max F. Meyer, Jr., and Richard L. McConnell, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 2, 1977, Ser. No. 773,566
Int. Cl.[2] C08L *23/12, 23/14*
U.S. Cl. 260—897 A **10 Claims**

1. An adhesive composition capable of being used as a hot-melt adhesive comprising a blend of

(1) 3 to 20 weight percent polyethylene having a melting point of 95° to 115° C., a melt viscosity at 190° C. of about 100 to about 30,000 and a density of about 0.904 g/cm^3 to about 0.940 g/cm^3, and an acid number of 0 to 60,

(2) 94 to 60 weight percent of amorphous poly-alph-olefin, and

(3) 3 to 20 weight percent of at least one member of the group consisting of crystalline polypropylene or crystalline propylene/ethylene copolymers containing not more than 20 percent by weight ethylene having a melt viscosity of about 100 to about 100,000 cp at 190° C.

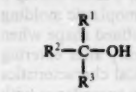
4,120,917
PROCESS FOR PREPARING TERTIARY ALKYLPHOSPHORODICHLORIDITES

Kirk D. Schmitt, Pennington, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 28, 1977, Ser. No. 782,271
Int. Cl.[2] C07F *9/146*
U.S. Cl. 260—976 **6 Claims**

1. A method which comprises reacting, at temperatures of 0° C. or less:

(a) A tertiary alcohol having the formula:



in which R^1, R^2 and R^3 are selected from the group consisting of alkyl having from about 1 to about 4 carbon atoms, aryl having from about 6 to about 8 carbon atoms, and aralkyl having from about 7 to about 10 carbon atoms, at least one being alkyl; with

(b) a tertiary amine in a molar ratio of tertiary amine to tertiary alcohol of 1:1 or more; and

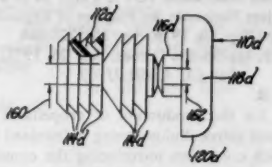
(c) PCl_3 in an amount from about 1.25 to about 4 moles of PCl_3 per mole of alcohol, which amount is in excess of the stiochometric amount needed to react with the alcohol, wherein said alcohol is added slowly to said excess PCl_3; and recovering, at temperatures of 0° C. or less, a tertiary alkyl phosphorodichloridite product.

4,120,918
TAMPER PROOF IDLE ADJUSTING SCREWS

Daryl O. Codling, Rochester, Mich., assignor to Colt Industries Operating Corp., New York, N.Y.

Filed May 16, 1977, Ser. No. 796,990
Int. Cl.[2] F02M *3/08*
U.S. Cl. 261—41 D **14 Claims**

1. A fuel metering system effective for metering the rate of fuel flow to an associated combustion engine, comprising body means, conduit means formed in said body means communicating with a source of fuel, orifice means formed generally in said body means for receiving fuel from said conduit means and discharging said fuel into induction passage means associated with said engine, an opening formed in said body means, said opening receiving adjustably positionable valve means, said valving means being selectively adjustably positionable with respect to said orifice means in order to thereby cooperate with said orifice means in order to cooperatingly define an effective metering area for metering said rate of said fuel flow from said conduit means and to said induction passage means, and closure means fitted into said opening as to effectively close said opening to access to said valving means, said closure means

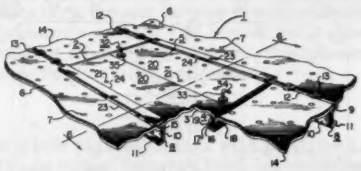


comprising stress localizing means effective to cause a structural failure at at least one preselected location in said closure means when an attempt is made to withdraw said closure means from said opening.

4,120,919
QUICK OPENING REMOVABLE TRAY SECTIONS FOR FLUID CONTACT

Robert W. McClain, Dallas, Tex., assignor to Glitsch, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 745,383, Nov. 11, 1976, abandoned. This application May 23, 1977, Ser. No. 799,711
Int. Cl.[2] B01D *3/32*
U.S. Cl. 261—114 TC **34 Claims**



1. In a tray for a fluid contact vessel, a quick opening removable tray section including

an open polygonal frame in the tray having lateral and transverse members defining the perimeter of an opening in said tray,

a cover complementary to the frame and composed of a pair of polygonal panels having adjacent inner lateral margins hingedly connected to each other so as to permit folding of the cover,

the panels of said cover having perimetrical outer lateral side and transverse end margins overlying and resting on the lateral and transverse members of said frame,

opposed means secured to the edge portions of said tray adjacent said lateral members of said frame for connecting the outer lateral side margins of said cover panels to said tray,

at least one of the opposed connecting means being immobile and overlying at least one of said lateral frame members in spaced relationship for slidably confining at least one of said outer lateral side margins of said panels, and

frictional fastening means at the perimetrical outer transverse side margin of at least one of said cover panels for detachably connecting at least one of said transverse margins of said panels to at least one of the underlying transverse members of said frame.

4,120,920

PROCESS FOR EXTRUSION OF PYROTECHNICAL COMPOSITIONS

Pierre Cougoul; Marc Saunier, both of Saint Medard en Jalles, and Jean Lucien Tranchant, Vert le Petit, all of France, assignors to Societe Nationale des Poudres et Explosifs, France

Filed Sep. 20, 1976, Ser. No. 725,044
Claims priority, application France, Sep. 25, 1975, 75 29338
Int. Cl.[2] C06B *21/00*
U.S. Cl. 264—3 R 9 Claims

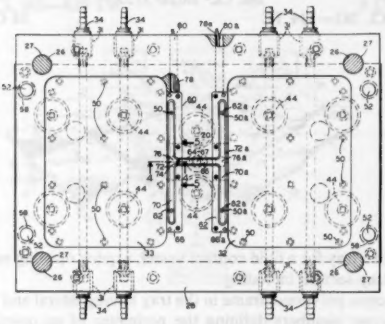
1. A process for the production of propellants based on nitrocellulose, said nitrocellulose being gelatinized by an explosive oil, which comprises introducing the constituents of the propellant into a screw extruder and subjecting the mixture of the constituents in the extruder to the following steps (1) mixing and shearing the constituents of the composition to effect gelatinization thereof; (2) compacting; (3) retarding the forward movement of the composition; (4) drying the gelatinized composition by evaporation under reduced pressure; (5) progressively pressurizing prior to extrusion of the composition from the outlet die of the extruder, carrying out said sequence of steps: (1), (2), (3), (4) and (5) at least once.

4,120,921

METHOD FOR INJECTION MOLDING PLASTIC

Geoffrey R. Webster, Coopersburg, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Division of Ser. No. 555,649, Mar. 5, 1975, Pat. No. 4,017,237. This application Dec. 13, 1976, Ser. No. 750,346
Int. Cl.[2] B29F *1/00*
U.S. Cl. 264—23 3 Claims



1. A method of injection molding a plurality of parts of plastic material comprising:

(a) providing a mold having at least two cavities therein, each of said cavities being connected by a runner to a common entry point,

(b) providing at least all but one of said cavities with a gate comprising a constriction orifice, each gate permitting the flow of said material therethrough only when ultrasonic energy is applied thereto,

(c) maintaining all but one cavity in the closed gate state and injecting plastic material into said mold until the said one cavity is filled, and

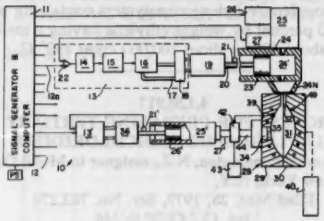
(d) after the material in said one cavity has frozen, sequentially supplying ultrasonic energy to the gate of each of the remaining cavities whereby plastic material in the constriction orifice increases rapidly in temperature and is permitted to pass therethrough and into the respective gated cavity, the material in each filled cavity being permitted to freeze before said energy is supplied to the next gate in the sequence.

4,120,922

METHOD FOR MOLDING

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 297,452, Oct. 13, 1972, Pat. No. 3,820,928, Continuation-in-part of Ser. No. 416,219, Nov. 15, 1973, Continuation of Ser. No. 194,630, Nov. 1, 1971, abandoned, Continuation of Ser. No. 725,401, Apr. 15, 1968, said Ser. No. 297,452, is a continuation-in-part of Ser. No. 849,014, Aug. 11, 1969, abandoned, which is a continuation-in-part of Ser. No. 721,401, Apr. 15, 1968, Pat. No. 3,616,495, which is a continuation-in-part of Ser. No. 421,860, Dec. 29, 1964, and Ser. No. 421,817, Dec. 29, 1964, and Ser. No. 439,549, Mar. 15, 1965, which is a continuation-in-part of Ser. No. 734,340, Mar. 9, 1958, Pat. No. 3,173,175. This application Jun. 25, 1974, Ser. No. 483,037
Int. Cl.[2] B29F *1/06*
U.S. Cl. 264—40.7 8 Claims



1. A method of molding articles of a molten molding material comprising the steps of:

injecting a predetermined quantity of molten thermoplastic molding material into a closed cavity of a mold during a molding cycle wherein said molten thermoplastic molding material is capable of solidifying to a defined shape when it cools and is operable to begin to solidify after entering said mold cavity and wherein the physical characteristics of the article molded thereof may vary in accordance with the rate of flow of said molding material into said mold and

during said molding cycle and as said molding material is injected into said mold cavity, predeterminately controlling the flow of said molten molding material into said mold cavity wherein the rate of flow of said molding material into and throughout said mold cavity varies in such a manner as to predetermine the manner in which said predetermined quantity of molding material solidifies throughout said mold cavity so as to provide a molded article having predetermined physical characteristics throughout the material of said molded article.

4,120,923

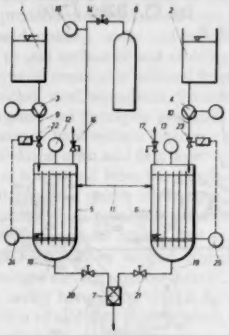
PROCESS FOR MANUFACTURING FOAMED MATERIALS INVOLVING CONTACTING A THIN UNBROKEN FILM OF LIQUID RESIN WITH A GASEOUS BLOWING AGENT UNDER PRESSURE

Werner Kloker; Franz Bovender; Franz Gromping, all of Krefeld; Leonhard Goerden, Oedt, and Harald Niesel, Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 15, 1975, Ser. No. 605,026
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1974, 2440022
Int. Cl.[2] B29D *27/04*
U.S. Cl. 264—45.3 3 Claims

1. A process of manufacturing foamed materials from a liquid thermosetting resin having a viscosity less than 6000 cP, comprising the steps of contacting a thin unbroken film of the liquid resin in a pressure vessel under pressure of 3 to 350 bars at a temperature of between 0° to 50° C. for a residence time of 0.1 to 120 minutes with a blowing agent having a boiling point

under normal pressure which is below 0° C., causing the liquid resin to smoothly flow without absorbing discernible bubbles of the blowing agent down and over an elongated surface means having a vertical component disposed within the pressure vessel whereby the liquid resin film absorbs the blowing agent so rapidly that the resin film flowing off from the elongated surface means can immediately be withdrawn from the pressure vessel, deposited on a surface, subjected to pressure release, allowed to expand and to cure into a foamed resin.

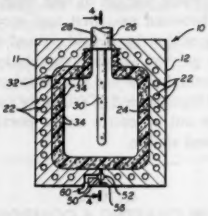


4,120,924

METHOD FOR MAKING FOAMED BLOWN WARE

Dewey Rainville, Westfield, N.J., assignor to Rainville Company, Inc., Westfield, N.J.

Filed Apr. 22, 1977, Ser. No. 789,832
Int. Cl.² B29G 7/02; B29D 27/00; B29F 5/00
U.S. Cl. 264—45.5 2 Claims



1. The method of making plastic blown ware including applying a molten tubular plastic blank to a mold cavity, blowing the plastic blank by supplying gas under pressure to the inside of the plastic blank to expand said plastic blank into contact with the wall of the mold cavity, cooling the mold so that the plastic forms a skin on the outside of the blank upon contact with the mold, and evacuating air from the mold cavity around the outside of the plastic blank to expedite the expansion of the plastic blank into contact with the wall of the mold cavity, characterized by supplying to the mold cavity a plastic blank that contains a blowing agent that expands the plastic by the formation of gas bubbles therein to produce an expanded or foamed wall for the plastic blank, formulating the plastic material and blowing agent to obtain a closed-cell foam, and reducing the pressure of the gas that blows the plastic blank immediately after the plastic blank has expanded into contact with the wall of the mold, and controlling the reduction in gas pressure to obtain a desired size of bubble within the plastic while the plastic is cooling to a hard condition in which the bubble size becomes set.

4,120,925

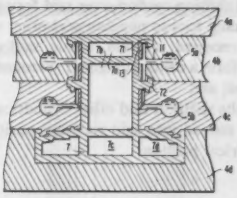
Patent Not Issued For This Number

4,120,926

PROCESS FOR REDUCING THE SHRINKAGE OF EXTRUDED PROFILED ELEMENTS OF THERMOPLASTIC SYNTHETIC RESINS

Siegfried Titz, Wissen, Germany, assignor to Dynamit Nobel Aktiengesellschaft, Germany

Filed Feb. 2, 1976, Ser. No. 654,726
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1975, 2504190
Int. Cl.² B29D 9/20
U.S. Cl. 264—89 3 Claims



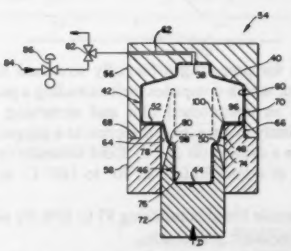
1. A process for reducing the shrinkage of profiled elements of thermoplastic synthetic resins, which shrinkage is produced by undesired stresses frozen in during extrusion in an extruder die and calibration in a calibrating device, which comprises maintaining the extrusion speed of the profiled element upon exiting from an extruder die at approximately the same speed as the calibrating speed and take-off speed of the profiled element during its subsequent passage through a calibrating device and cooling the extruded profiled element in the inlet phase of the calibration in said calibration device at defined locations distributed over the periphery of the cross section of the element to a greater extent than at the remaining locations of the periphery, whereby a reinforcing corset is produced which absorbs the tensile forces during the subsequent further drawing of the element through the calibrating device, the exit cross section of the extruder die being so dimensioned that the profiled element is extruded with cross-sectional dimensions that correspond approximately to those of the calibrated element exiting from the calibrating device.

4,120,927

PROCESS FOR MAKING A ONE PIECE ROTOR LINER

Steven Thomas Nielsen, Sunnyvale, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed May 10, 1976, Ser. No. 684,814
Int. Cl.² B29C 17/07
U.S. Cl. 264—98 4 Claims



1. A process for making a one piece generally enclosed convolute rotor liner having two chambers in fluid communication comprising the steps of:

molding an elongated member having at least two generally cylindrical shaped portions concentrically aligned along the rotational axis of said liner, one of said portions having a diameter greater than the other of said portions, said

portions being integrally joined and longitudinally spaced from each other along said axis by a shifting section, said elongated member having a ridge located at the interface of said other cylindrical portion and said shifting section;

placing said other cylindrical portion within a mating recess of a forcing tool;

engaging said ridge with the forward annular rim of said forcing tool;

holding said one cylindrical portion in a stationary position;

moving said other cylindrical portion toward said one cylindrical portion;

pivoting said shifting section over said forward annular rim of said forcing tool to position said other cylindrical portion in a recessed position within said one cylindrical portion to form a central chamber surrounded by an annular chamber; and

maintaining the shape of said other cylindrical portion while it is being moved into said recessed position within said one cylindrical portion.

4,120,928

PRODUCTION OF BIAXIALLY STRETCHED FILM OF POLYAMIDE BLEND

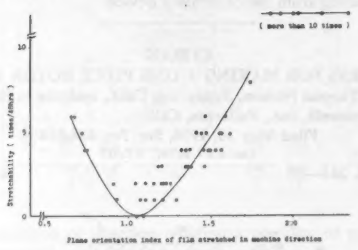
Kaoru Furukawa, Takatsuki; Koichi Matsunami, Otsu; Toshihiko Ota, Otsu; Tetsushi Murakami, Otsu; Hiroshi Nagai, Otsu, and Kazuo Tamaki, Otsu, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Apr. 15, 1977, Ser. No. 788,047

Claims priority, application Japan, Apr. 19, 1976, 51-44689; May 8, 1976, 51-52559; May 8, 1976, 51-52561; May 10, 1976, 51-53685; May 10, 1976, 51-53686; Aug. 9, 1976, 51-95277; Aug. 5, 1976, 51-93830

Int. Cl.[2] **B29D** *7/24*

U.S. Cl. 264—171 **25 Claims**



1. A process for preparing a biaxially stretched film of a polyamide blend, which comprises melt extruding a polyamide blend to make an unstretched film and stretching the unstretched film firstly in a machine direction at a temperature of 50° to 130° C. in a draw ratio of 2 to 5 and secondly in a transverse direction at a temperature of 70° to 160° C. in a draw ratio of 2 to 5,

(a) said polyamide blend comprising 97 to 80% by weight of an α-type aliphatic polyamide,

(b) and 3 to 20% by weight of at least one polyamide selected from the group consisting of:

(i) an α-type aliphatic polyamide different from the polyamide in (a),

(ii) a γ-type aliphatic polyamide,

(iii) a non-crystalline aliphatic polyamide, and

(iv) a ring-containing polyamide which contains in the molecule 0 to 50 mol % of repeating units comprising a xylylenediamine residue.

4,120,929

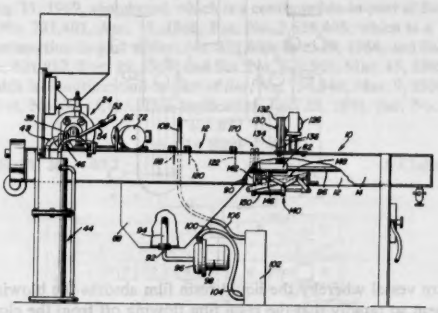
METHOD FOR PRODUCING A SPIRALLY WOUND PLASTIC ARTICLE

Donald J. Reum, P.O. Box B, Albany, Minn. 56307

Filed Dec. 28, 1976, Ser. No. 755,079

Int. Cl.[2] **B29C** *17/00*

U.S. Cl. 264—210 R **8 Claims**



1. The method of producing a spirally wound article of thermoplastic material, said method comprising extruding a heated strip of thermoplastic material from a die with the strip including opposite side longitudinal side surfaces interconnected by narrow opposite side longitudinal edges, advancing said strip past first and second stations while drawing said strip down between said die and said first station, performing controlled initial partial contact cooling of one side surface of said strip at said first station, arcuately deflecting said strip at said first station during said partial cooling of said strip and with said side edges of said strip comprising the inner and outer portions of the arcuate section of said strip, further drawing said strip down between said first and second stations, and thereafter guiding said strip, at said second station, through a plurality of strip guiding spaced convolutions about a journaled cylindrical member driven at a peripheral speed substantially equal to the linear speed of said strip and further cooling said strip through out at least a major portion of its passage through said second station.

4,120,930

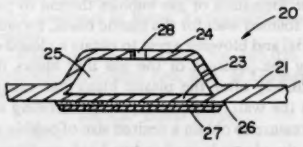
METHOD OF COATING A COMPOSITE MOLD

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation of Ser. No. 495,793, Aug. 8, 1974, abandoned, Continuation-in-part of Ser. No. 300,299, Oct. 24, 1972, Pat. No. 3,827,667, which is a continuation of Ser. No. 53,833, Jul. 10, 1970, abandoned, which is a continuation-in-part of Ser. No. 601,259, Nov. 1, 1966, Pat. No. 3,529,987, which is a continuation-in-part of Ser. No. 432,033, Nov. 25, 1964, Pat. No. 3,414,863, and Ser. No. 432,924, Jan. 8, 1965, Pat. No. 3,346,220. This application Sep. 2, 1976, Ser. No. 719,807

Int. Cl.[2] **B29C** *1/02, 1/04;* **B28B** *7/36;* **B22B** *9/00*

U.S. Cl. 264—225 **1 Claim**



1. A method of molding comprising:

producing a mold for shaping a material to be molded by casting a first mold portion formed of a material selected from the group consisting of: Portland cement, carbon, pyrolytic graphite, castable ceramic material, mortar and

plastic resins in a form of a predetermined shape to define a mold base having a first surface portion having a molding cavity formed therein of a predetermined configuration,

flowing and depositing a first layer of material to form a coating of predetermined thickness onto said first surface portion of said molding cavity and bonding said first layer of material to said surface of said molding cavity whereby said first layer of material is selected from the group consisting of: nickel, steel, aluminum, titanium, coper, molybdenum, tungsten and pyrolytic graphite,

depositing a second hard surface layer as a coating of predetermined thickness onto said first layer whereby said hard surface layer is selected from the group consisting of the carbides, nitrides, and oxides of tungsten, titanium, boron, silicon, aluminum, and pyrolytic graphite,

operatively assembling said coated first mold portion in a forming machine with a second complementary mold member having a surface portion thereof, which is shaped to define a cavity between at least a portion of said first surface portion of said first mold portion, and a portion of the surface of said second mold member when the two are so operatively assembled,

and disposing a material to be molded between said first mold member and said second complementary mold member in said cavity and forming said material to shape therebetween by engaging at least a portion of the surface of said second hardened layer so as to shape said moldable material.

4,120,931
METHOD OF MANUFACTURING ORIENTED AMORPHOUS AROMATIC POLYMERIC FILMS

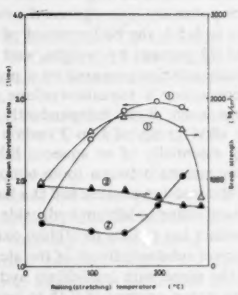
Nobuo Fukushima, Otsu; Yukikazu Uemura, Amagasaki; Takuzo Okumura, Tokyo, and Haruo Hayashida, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 26, 1977, Ser. No. 801,020

Claims priority, application Japan, May 27, 1976, 51-61896; Sep. 22, 1976, 51-114278; Dec. 20, 1976, 51-153921

Int. Cl.[2] B29D *7/24;* B29C *17/02*

U.S. Cl. 264—288 **28 Claims**



17. A method for producing a high-strength film of an amorphous aromatic high polymer, which comprises passing a raw film comprising said high polymer, which contains more than 80% of an amorphous resin having aromatic nuclei in the main chains thereof, a crystallinity of less than 30% and a secondary transition point of higher than 150° C., through at least one pair of compression rolls maintained between the temperatures of 100° C. lower than and 50° C. higher than the secondary transition point of said amorphous resin, thereby rolling said raw film, and then stretching the rolled film in at least one of the following directions:

(1) the same direction as the rolling direction, and

(2) a direction normal to the rolling direction, said stretching being carried out between the temperatures of 100° C. lower than and 50° C. higher than the secondary transition point of said amorphous resin.

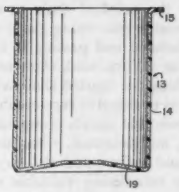
4,120,932
METHOD OF FABRICATING PLASTIC CONTAINERS HAVING REDUCED GAS PERMEABILITY FROM A COMPOSITE BILLET

Donald J. Roth, Chicago Heights, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Continuation of Ser. No. 615,254, Sep. 22, 1975, abandoned, which is a division of Ser. No. 469,486, May 13, 1974, Pat. No. 3,923,190. This application Nov. 24, 1976, Ser. No. 744,557

Int. Cl.[2] B29C *17/03*

U.S. Cl. 264—292 **13 Claims**



1. A method of forming a thermoplastic container having increased resistance to gas permeability which comprises preparing a composite billet comprised of an outer peripheral area consisting essentially of a moldable thermoplastic resin and an internal central core comprised of the thermoplastic resin modified with a second material which lowers the gas pemeability of the resin, the outer peripheral area being substantially devoid of the second material, and then molding the billet into a hollow container having a body closed at one end and terminating in an upper open end surrounded with a peripheral flange integral with the body, the flange being formed from the thermoplastic outer peripheral area of the billet and the body being formed from the modified thermoplastic billet core.

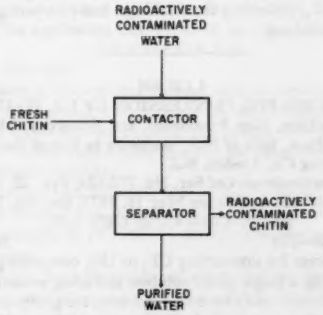
4,120,933
DECONTAMINATION OF PLUTONIUM FROM WATER WITH CHITIN

Gary L. Silver, Centerville, Ohio, assignor to The United States of America as represented by the Unites States Department of Energy, Washington, D.C.

Filed Sep. 27, 1977, Ser. No. 837,251

Int. Cl.[2] C01G *56/00*

U.S. Cl. 423—6 **1 Claim**



1. A process for removing at least an 80% portion of plutonium from an aqueous solution containing said plutonium comprising; adding to said aqueous solution a buffer solution to

provide a pH in the range of about 5 to about 10, thereafter contacting said resulting solution with comminuted chitin, subsequently agitating said solution, thereafter separating the solution from the chitin, and finally incinerating the chitin to produce an ash containing a portion of said plutonium.

4,120,934

METHOD FOR WORKING-UP SHALE

Thomas K. Miöen, Stockholm, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

Filed Jun. 25, 1976, Ser. No. 700,032
Claims priority, application Sweden, Jul. 1, 1975, 7507509
Int. Cl.[2] B01D *11/00*
U.S. Cl. 423—18 18 Claims

1. A method for working-up shale while recovering metals therefrom and the sulfur content thereof, comprising crushing the shale; roasting the crushed shale in a roasting furnace, whereby a sulfur dioxide containing gas is obtained; removing the gas from the furnace and passing it to a stage in which sulfur is recovered as sulfuric acid, elementary sulfur or liquid sulfur dioxide; leaching the roasted shale with a aqueous sulfuric acid solution so as to dissolve recoverable metals present in the shale, said recoverable metals comprising one or more of the metals uranium, molybdenum, vanadium, aluminum, magnesium, potassium and sodium and also any phosphorus in the form of phosphate; recovering valuable constituents of the leaching soution by means of extraction and precipitation; passing the residual leaching solution to the roasting furnace and converting in said roasting furnace the sulfur content of the residual leaching solution to sulfur dioxide during simultaneous roasting and combustion of the shale therein.

4,120,935

DUMP LEACHING OF COPPER

Gerald F. Fountain; Jaime Veloz, and Harry R. Dahlberg, all of Inspiration, Ariz., assignors to Inspiration Consolidated Copper Company, Morristown, N.J.

Continuation of Ser. No. 692,935, Jun. 4, 1976, abandoned. This application Nov. 11, 1977, Ser. No. 850,442
Int. Cl.[2] C22B *15/08*
U.S. Cl. 423—41 8 Claims

1. The method of recovering copper from low grade oxidized copper ore containing a substantial amount of tenorite, melaconite, or other oxidized mineral substantially insoluble in dilute aqueous sulfuric acid which comprises establishing a dump of such ore in fragmented form; said dump being a depth of at least about 10 feet, percolating into said dump a strong aqueous sulfuric acid solution containing at least about 200 g/l H_2SO_4 until the ore fragments are substantially completely wetted, then discontinuing such percolation and allowing the wetted ore to age in contact with the strong acid for a period from about 10 to 30 days, then percolating through the dump a washing of dilute aqueous sulfuric acid containing about 10 to 30 g/l H_2SO_4, collecting the washings, and recovering copper from said washing.

4,120,936

PROCESS FOR CONVERSION OF UF_6 TO UO_2

John P. DeLuca, New Providence, and Edward T. Maas, Jr., Kendall Park, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 773,129, Feb. 28, 1977, abandoned. This application May 16, 1977, Ser. No. 797,538
Int. Cl.[2] C01G *43/02;* C07F *5/00*
U.S. Cl. 423—261 29 Claims

1. A process for converting UF_6 to UO_2 comprising:

(a) forming a single phase solution including an active solution of water and a base selected from the group consisting of pyridine and methyl-substituted pyridines, N,N-disubstituted carboxylic acid amides, ammonia and mono-, di- and trimethyl substituted amines, sulfoxides and sulfones and an inert diluent acetonitrile.

(b) adding UF_6 to said single phase solution so that said UF_6 reacts with said single phase solution to form a uranyl fluoride containing precipitate which is separated from the remaining single phase solution, and

(c) converting said precipitate to UO_2 by thermal and reductive means.

4,120,937

PROCESS FOR THE PRODUCTION OF HALOSILICON ACIDS AND ORGANIC SILICON ACID COMPOUNDS AND RESINOUS PRODUCTS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Filed Oct. 25, 1977, Ser. No. 845,464
Int. Cl.[2] C01B *25/01*
U.S. Cl. 423—325 29 Claims

1. The process for the production of halosilicon acids by the following steps:

(a) mixing about 1 part by weight of a dry, fine, granular hydrated silica with about 1 to 2 parts by weight of a silicon tetrahalide, silicon tetrachloride;

(b) agitating the mixture at ambient temperature and pressure for 1 to 4 hours, and the chemical reaction is complete in 6 to 12 hours, thereby

(c) producing a white, fine, granular mixture of halosilicon acids.

4,120,938

AQUEOUS SOLUTIONS OF ALKALI POLYSILICATES

Rainer Haase, Bokel, Schleswig, Holstein; Volker Hunger, Rheidt, and Arnold Lenz, Cologne-Stammheim, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Division of Ser. No. 496,778, Aug. 12, 1974, Pat. No. 3,984,526. This application Jul. 8, 1976, Ser. No. 748,603
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1973, 2343026
The portion of the term of this patent subsequent to Oct. 5, 1993, has been disclaimed.
Int. Cl.[2] C01B *33/32*
U.S. Cl. 423—332 5 Claims

1. A stable aqueous lithium polysilicate solution of a lithium polysilicate, said solution containing alkoxy groups of 1 to 3 carbon atoms, said solution having less than 50 parts per million of sodium or potassium ions wherein the mol ratio of silica to lithium oxide is 4–5:1, the SiO_2 content of said solution is between 20 and 22 percent by weight, said stable aqueous lithium polysilicate solution prepared by a process consisting essentially of contacting a tetraalkoxysilane of the formula $Si(OR)_4$ wherein each R is independently a straight or branched-chain alkyl group of 1 to 3 carbon atoms with an agent consisting essentially of an aqueous lithium hydroxide solution at a temperature between room temperature and the boiling point of the reaction mixture and at a temperature up to 100° C., the ratio of silane to lithium hydroxide being such that the reaction product has a silica to lithium oxide mol ratio of 4–5:1, distilling over substantially all of the alcohol formed by the reaction of the silane with the lithium hydroxide down to a residual alkoxy group content of 0.15 to less than 2 weight percent and during or immediately following said distillation adding water to adjust the silica content of said solution to between 20 and 22 weight percent and cooling the resultant product with stirring.

4,120,939

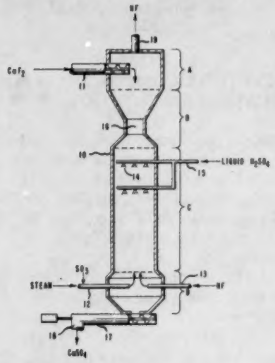
HYDROGEN FLUORIDE PROCESS

William Hollis Ehlig, Baytown, Tex., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 26, 1977, Ser. No. 800,869
Int. Cl.[2] C01B *7/22*
U.S. Cl. 423—483 4 Claims

1. In a process for producing hydrogen fluoride by the reaction of sulfuric acid with a metal fluoride to produce gase-

ous hydrogen fluoride and metal sulfate wherein the energy balance is satisfied by feeding part of the sulfuric acid required for the mass balance as vaporous sulfur trioxide and steam and the remainder is fed as liquid sulfuric acid, the improvement comprising dropping particles of said metal fluoride having a particle size between 1 and 300 microns through the reaction zone of a vertical, stationary reactor countercurrent to a gas stream containing sulfur trioxide, sulfuric acid and water vapor, said gas stream being at or near its dew point in the reac-



tion zone, introducing liquid sulfuric acid into the reaction zone, the rate of fall of said particles within the reaction zone being such that a liquid phase of condensed sulfuric acid is maintained on the surfaces of the particles while in said zone and the particles and acid are maintained in the free fall state for a preiod of time sufficient to complete the reaction to form gaseous hydrogen fluoride, and recovering gaseous hydrogen fluoride from the top of said reactor and removing metal sulfate from the bottom of said reactor.

4,120,940

DIRECT PRODUCTION OF COARSE PARTICLE INORGANIC FLUORIDES

William Carl Warneke, Lakeland, Fla., assignor to Borden, Inc., Columbus, Ohio

Filed Jun. 27, 1977, Ser. No. 810,047
Int. Cl.[2] C01F *5/28, 11/22*
U.S. Cl. 423—490 **4 Claims**

1. A process for making a controlled size and shape particulate material selected from the group consisting of calcium fluoride and magnesium fluoride substantially free of finely-divided powder resulting from combining

(1) a solid coarse particle reactant selected from calcium carbonate and magnesium oxide and having an average particle size greater than about 100 microns and the particle shape desired in the final product, and

(2) a dilute aqueous reactant solution selected from solutions of hydrofluoric acid and ammonium fluoride that completely mixes with said solid reactant to form a reactive mixture,

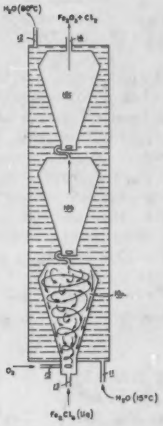
raising the temperature of the reactive mixture to from 90° F to boiling temperature for from ½ to 5 hours to cause reaction between (1) and (2) and to form a coarse particulate product, and separating said particulate product from the mixture by drying at from 180° to 225° F followed by calcining at about 1000° F for a sufficient time to remove remaining water without disturbing the particle size and shape of said product, which particle size is substantially identical to that of said solid reactant.

4,120,941

PROCESS FOR THE OXIDATION OF HALIDES

Rudolf Nowak, and Gerhard Holland, both of Frankfurt am main, Fed. Rep. of Germany, assignors to Halomet AG, Basel, Switzerland

Filed Oct. 31, 1974, Ser. No. 519,505
Int. Cl.[2] C01B *13/14*
U.S. Cl. 423—592 **6 Claims**



1. In a process for the oxidation of halides or mixtures thereof with oxygen or oxygen-containing gases in an oxidation chamber, the improvement wherein solid or liquid halides are supplied to the oxidation chamber through an inlet nozzle, the temperature at which said solid or liquid halides are supplied to the oxidation chamber and/or the pressure in the oxidation chamber being selected so that the vapor pressure of the halides supplied is greater than the pressure in the oxidation chamber, up to or substantially to the critical temperature of said halides to thereby prevent any substantial crust formation at or on the inlet nozzle.

4,120,942

STAGED REHYDRATION OF ALUMINA

Donald P. Spitzer, Riverside, and William Edward Bambrick, Old Greenwich, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 696,093, Jun. 14, 1976, abandoned.
This application Oct. 17, 1978, Ser. No. 842,849
Int. Cl.[2] C01F *7/02*
U.S. Cl. 423—626 **8 Claims**

1. A method of preparing formed alumina extrudates from a partially dehydrated, rehydratable alumina prepared by flash calcining Bayer process alumina, and having LOI in the range from 3 to 15 and rehydration index in the range from 15 to 80, said method comprising:

rehydrating said partially dehydrated alumina by mixing with water which contains acid at pH below 7 and heating the mixture to 80°–100° C. for the time needed for rehydration;

solidifying the rehydrated alumina; mulling the solidified, rehydrated alumina with sufficient water to make a mulled mixture suitable for extrusion;

extruding the mulled mixture into a desired extrudate shape; and

drying said extrudate shapes and calcining the dried extrudate to activate the alumina.

4,120,943
PROCESS FOR PRODUCING PSEUDO-BOEHMITE

Toshiyuki Iwaisako; Naomi Yamaguchi; Hisao Yomogida, and Yoshinobu Ito, all of Tokyo, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 683,520, May 5, 1976, abandoned, which is a continuation of Ser. No. 456,389, Mar. 29, 1974, abandoned. This application Dec. 17, 1976, Ser. No. 751,683

Claims priority, application Japan, Apr. 6, 1973, 48/38774

Int. Cl.[2] C01F *7/02, 7/34*

U.S. Cl. 423—628 10 Claims

1. A process for the production of a pseudo-boehmite product which comprises initially mixing an alkali aluminate and a halohydrin selected from the gorup consisting of ethylene chlorohydrin, propylene chlorohydrin, epichlorohydrin, trimethylene chlorohydrin, glycerol monochlorohydrin, glycerol dichlorohydrin, and 1-hydroxy-2-chloropropyl-methacrylate for a period of 5 seconds to 10 hours at a temperature of from −10° C. to 50° C., the molar ratio of halohydrin to alkali aluminate being from 0.8 to 20, the concentration of alkali aluminate being up to 25% by weight, and thereafter raising the temperature of the mixture to from 50° C. to 100° C. to effect precipitation of the desired pseudo-boehmite; said pseudo-boehmite characterized by the following physical properties:

(a) bulk density, 0.05 to 0.2 g/cc;
(b) oil absorption, 2.5 to 6.0 cc/g;
(c) specific surface area, 200 to 500 m^2/g;
(d) pore volume, 2.0 to 7.0 cc/g (0.0035μ–176μ);
(e) Pore volume, 2.0 to 4.0 cc/g (0.176μ–176μ).

4,120,944
PREPARATION OF CARBONYL SULFIDE AND PRODUCTION OF METHYL MERCAPTAN THEREFROM

Donald H. Kubicek, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 31, 1976, Ser. No. 719,220

Int. Cl.[2] C01B *31/26;* C07C *149/06*

U.S. Cl. 423—416 10 Claims

1. A process for the production of methyl mercaptan which comprises contacting at a temperature in the approximate range of 300° to 600° F. and a pressure in the approximate range of 0 to 1000 psig a mixture of carbonyl sulfide and hydrogen with a sulfactive hydrogenation catalyst consisting essentially of a combination of at least one Group VIII sulfide, at least one Group VI sulfide and an inorganic oxide support.

9. A process for the production of carbonyl sulfide which comprises contacting a mixture of carbon dioxide and carbon disulfide with a supported phosphotungstic acid catalyst at a temperature in the approximate range of 400° to 550° F. and a pressure in the approximate range of 0–psig.

4,120,945
SUBSTRATE COATED WITH RECEPTOR AND LABELED LIGAND FOR ASSAYS

Sidney Gutcho, Monsey, and Henry McCarter, Pine Island, both of N.Y., assignors to Becton, Dickinson & Company, Rutherford, N.J.

Filed Jul. 6, 1976, Ser. No. 702,691

Int. Cl.[2] G01N *33/16, 23/00, 31/06*

U.S. Cl. 424—1 19 Claims

1. An article for the assay of a ligand, comprising:

a solid, a receptor for both the ligand to be assayed and a labeled form of the ligand to be assayed on said solid, and a labeled form of the ligand to be assayed reversibly coated on at least 0.5% and no more than 25% of the surface of said receptor, whereby during an assay for the ligand, the labeled form of the ligand is removed from the receptor for re-equilibration with the receptor in competition with the ligand to be assayed.

12. In a process for the assay of a ligand, the improvement comprising:

equilibrating a sample including the ligand to be assayed with a solid phase having a receptor applied thereto and a labeled form of the ligand reversibly coated on at least 0.5% and no more than 25% of the surface of the receptor, whereby the labeled form of the ligand is removed from the receptor for re-equilibration with the receptor in competition with the ligand to be assayed.

4,120,946
PHARMACEUTICAL COMPOSITIONS FOR BARIUM OPACIFICATION AND METHOD OF PREPARING THEM

André Queuille, 93, rue Denfert-Rochereau, 93130 Noisy-le-Sec, and Francoise Herbemont, 10 La Renardiere, 1, rue Jean-Jaures, 93470 Coubron, both of France

Filed May 23, 1977, Ser. No. 799,163

Claims priority, application France, May 26, 1976, 76 15975

Int. Cl.[2] A61K *29/02*

U.S. Cl. 424—4 8 Claims

1. A pharmaceutical composition for barium opacification of the digestive tract, comprising colloidal barium sulfate and a polyacrylamide having a molecular weight of at least about one million in an aqueous vehicle, the polyacrylamide content being between 0.1% and 5% of the barium sulfate content.

4,120,947
XANTHINE COMPOUNDS AND METHOD OF TREATING BRONCHOSPASTIC AND ALLERGIC DISEASES

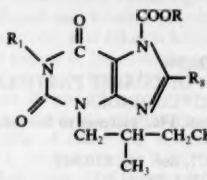
Julius Diamond, Morris Plains, N.J., assignor to Cooper Laboratories, Inc., Parsippany, N.J.

Filed Mar. 31, 1976, Ser. No. 672,388

Int. Cl.[2] C07D *473/06;* A61K *31/52*

U.S. Cl. 424—45 48 Claims

1. A compound having the formula:



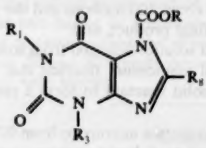
wherein

R_1 = C_1–C_2 alkyl

R_8 = H, C_1–C_4 alkyl

R = C_1–C_4 alkyl, 2-halo-(C_2-C_3 alkyl), or phenyl

16. A pharmaceutical composition comprising an amount effective for bronchodilation of a compound of the formula:



wherein

R_1 = C_1–C_2 alkyl

R_3 = CH_2—(C_3–C_4 alkyl), CH_2—(C_3–C_4 alkenyl), CH_2—(C_3–C_4—cyclo—alkyl)

R_8 = H, C_1–C_4 alkyl

R = C_1–C_4 alkyl, 2-halo—(C_2–C_3 alkyl), or phenyl

in combination with a non-toxic inert pharmaceutically accept-

able diluent to give a dosage form selected from tablets, capsules, or aerosol mists.

4,120,948

TWO PHASE ANTIPERSPIRANT COMPOSITIONS

David Lee Shelton, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 29, 1976, Ser. No. 745,723
Int. Cl.[2] A61K 7/34
U.S. Cl. 424—66 10 Claims

1. An antiperspirant composition in the form of a two-phase stick, said composition comprising:

(A) from about 40 to 60% by weight of the composition of a solid, substantially anhydrous antiperspirant phase comprising

I. from about 8 to about 15% by weight of the antiperspirant phase of a water-insoluble high melting wax which has a melting point of from about 150° F. to about 215° F.

II. from about 20 to about 50% by weight of the antiperspirant phase of a water-insoluble liquid, organic, nonhydrocarbon emollient; and

III. from about 30 to about 60% by weight of the antiperspirant phase of a solid particulate astringent antiperspirant material; and,

(B) from about 40 to 60% by weight of the composition of a gel phase contiguous to said solid antiperspirant phase, said gel phase comprising

I. from about 10 to 92% by weight of the gel phase of a polyhydric aliphatic alcohol containing from 2 to 4 carbon atoms and from 2 to 3 hydroxy groups; and

II. from about 5 to 15% by weight of the gel phase of a gel forming agent selected from the group consisting of sodium salt of a fatty acid containing from 14 to about 22 carbon atoms and potassium salt of a fatty acid containing from about 14 to about 22 carbon atoms.

4,120,949

OPHTHALMIC SOLUTION

Krishna M. Bapatla, Succasunna, and Katharyn M. Brychta, Morris Plains, both of N.J., assignors to Cooper Laboratories, Inc., Parsippany, N.J.

Filed Oct. 5, 1977, Ser. No. 839,332
Int. Cl.[2] A61K 31/74, 31/79
U.S. Cl. 424—80 8 Claims

1. An ophthalmic solution having the following composition:

Hydroxyethyl cellulose	0.8%
Polyvinylpyrrolidone	1.5%
Polyvinyl alcohol	0.5%
Hydroxypropyl methylcellulose	0.4%
Benzalkonium chloride	0.01%
Disodium edetate	0.01%

in a physiologically acceptable aqueous phosphate buffer, having a pH of 6.0 to 8.0.

4,120,950

MEDICAMENT FOR PREVENTING AND TREATING PSEUDOMONAS AERUGINOSA INFECTIONS AND METHOD OF ITS PREPARATION

Yuzuru Homma, Tokyo, Japan, assignor to The Green Cross Corporation, Osaka, Japan

Filed Aug. 17, 1976, Ser. No. 715,198
Claims priority, application Japan, Feb. 5, 1976, 51-10866
Int. Cl.[2] A61K 39/40; C07G 7/00
U.S. Cl. 424—87 7 Claims

1. A composition suitable for preventing and eliminating infectious diseases caused by P. aeruginosa which produce elastase and protease, and which comprises a γ-globulin aqueous solution prepared from human serum or plasma showing an HA liter of at least ×128 for OEP antibodies, at least ×32 for elastase antibodies and at least ×64 for protease antibodies.

4,120,951

POLYPEPTIDE HORMONES OF THE THYMUS

Gideon Goldstein, Riverdale, N.Y., assignor to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Division of Ser. No. 606,843, Aug. 22, 1975, which is a continuation-in-part of Ser. No. 429,202, Dec. 28, 1973, abandoned. This application May 9, 1977, Ser. No. 795,333
Int. Cl.[2] A61K 37/00
U.S. Cl. 424—177 16 Claims

1. A therapeutic composition of matter comprising a therapeutically effective amount of the polypeptide:

H_2N—GLY—GLN—PHE—LEU—GLU—ASP—PRO—SER—VAL—LEU—THR—LYS—GLU—LYS—LEU—LYS—SER—GLU—LEU—VAL—ALA—ASN—ASN—VAL—THR—LEU—PRO—ALA—GLY—GLU—GLN—ARG—LYS—ASP—VAL—TYR—VAL—GLN—LEU—TYR—LEU—GLN—HIS—LEU—THR—ALA—VAL—LYS—ARG—COOH,

in a pharmaceutically acceptable carrier.

4,120,952

METHOD FOR THE TREATMENT OF DIARRHEA IN MONOGASTRIC ANIMALS

Bartley P. Cardon, Tucson, Ariz., assignor to Arizona Feeds, Tucson, Ariz.

Continuation-in-part of Ser. No. 619,903, Oct. 6, 1975, Pat. No. 4,010,262. This application Feb. 22, 1977, Ser. No. 771,176
The portion of the term of this patent subsequent to Oct. 7, 1992, has been disclaimed.
Int. Cl.[2] A61K 31/715
U.S. Cl. 424—180 10 Claims

1. The method of treating monogastric animals suffering from diarrhea, comprising orally administering to the animal an effective amount of pregelatinized starch in a liquid mixture.

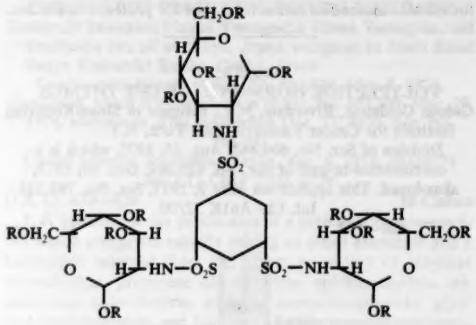
4,120,953

NOVEL 2,2',2''-[s-PHENENYLTRIS(SULFONYLIMINO)TRIS]-[2-DEOXY-α-D-GLUCOPYRANOSE], DODECAKIS (H-SULFATE) COMPOUNDS AND THEIR SALTS

Vijay Gopalan Nair, Nanuet, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

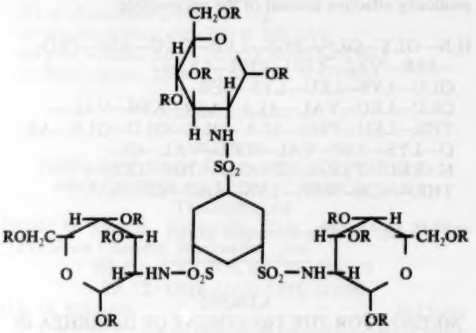
Filed Apr. 4, 1977, Ser. No. 784,491
Int. Cl.[2] A61K 31/70
U.S. Cl. 424—180 14 Claims

6. A method of inhibiting the complement system in a body fluid which comprises subjecting said body fluid to the action of an effective complement inhibiting amount of a pharmaceutically acceptable compound of the formula:



wherein R is a moiety selected from the group consisting of $-SO_3H.N(CH_3)_3$ and $-SO_3X$, wherein X is selected from the group consisting of alkali metal; and the pharmaceutically acceptable salts thereof.

10. A method of inhibiting the complement system in a warm-blooded animal which comprises internally administering to said animal an effective complement inhibiting amount of a pharmaceutically acceptable compound of the formula:



wherein R is a moiety selected from the group consisting of $-SO_3H.N(CH_3)_3$ and $-SO_3X$, wherein X is selected from the group consisting of alkali metal; and the pharmaceutically acceptable salts thereof.

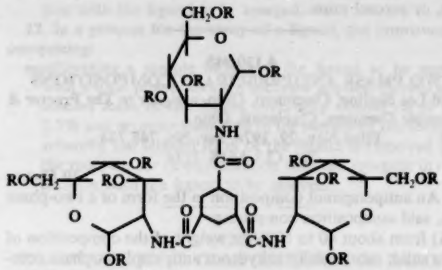
4,120,954

2,2',2''-[S-PHENENYLTRIS(CARBONYLIMINO)]TRIS-2-DEOXY-D-GLUCOPYRANOSE AND SALTS THEREOF

Joseph Peter Joseph, Cliffside Park, N.J., and Seymour Bernstein, New City, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

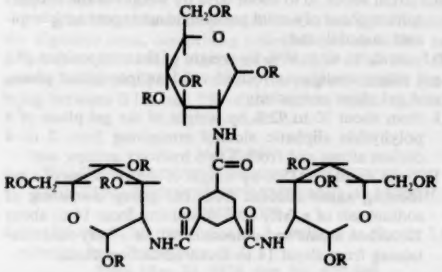
Filed Apr. 4, 1977, Ser. No. 784,202
Int. Cl.[2] A61K *31/70*
U.S. Cl. 424—180 **21 Claims**

8. A method of inhibiting the complement system in body fluid which compresses subjecting said body fluid to the action of an effective complement inhibiting amount of a compound of the formula:



wherein R is selected from the group consisting of hydrogen, acetyl, $-SO_3Na$, $-SO_3H.N(CH_2CH_3)_3$ and $-SO_3H.N(CH_3)_3$.

14. A method of inhibiting the complement system in a warm-blooded animal which compresses internally administering to said animal an effective complement inhibiting amount of a compound of the formula:



wherein R is selected from the group consisting of hydrogen, acetyl, $-SO_3Na$, $-SO_3H.N(CH_2CH_3)_3$ and $-SO_3H.N(CH_3)_3$.

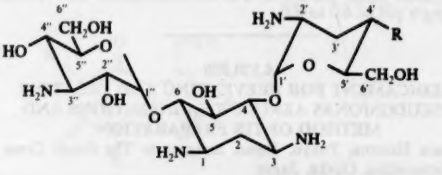
4,120,955

METHOD FOR PRODUCTION OF KANAMYCIN C AND ITS DERIVATIVES

Hamao Umezawa, Tokyo, and Shinichi Kondo, Yokohama, both of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Filed May 23, 1977, Ser. No. 799,806
Claims priority, application Japan, Jun. 16, 1976, 51-69759
Int. Cl.[2] A61K *31/71;* C07H *15/22*
U.S. Cl. 424—180 **6 Claims**

3. A deoxykanamycin C compound of the formula (I'):



(I')

wherein R is a hydroxyl group or hydrogen atom, or a pharmaceutically acceptable acid-addition salt thereof.

6. An antibacterial composition comprising as the active ingredient deoxykanamycin C compound according to claim 3, in an antibacterially effective amount to inhibit the growth of bacteria, in combination with a carrier for the active ingredient.

4,120,956
COMBATING ARTHROPODS WITH 3-ALKOXYMETHYL-AND-ALKYLTHIOMETHYL-PYRAZOL(5)YL(THIONO)(THIOL)-PHOSPHORIC(PHOSPHONIC) ACID ESTERS AND ESTER-AMIDES

Fritz Maurer; Hans-Jochem Riebel; Rolf Schröder, all of Wuppertal; Ingeborg Hammann, Cologne; Wolfgang Behrenz, Overath, and Wilhelm Stendel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

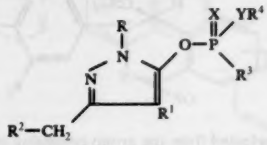
Filed Sep. 19, 1977, Ser. No. 834,861

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1976, 2643564

Int. Cl.[2] **A01N** *9/36;* **C07F** *9/165, 9/141, 9/38*

U.S. Cl. 424—200 **10 Claims**

1. A compound of the formula



in which

R is hydrogen, alkyl with 1 to 6 carbon atoms, cyanoalkyl with 1 to 4 carbon atoms in the alkyl part or phenyl,

R^1 is hydrogen or halogen,

R^2 is alkoxy or alkylthio each with 1 to 6 carbon atoms,

R^3 is alkyl, alkoxy or monoalkylamino each with 1 to 6 carbon atoms, or phenyl,

R^4 is alkyl with 1 to 6 carbon atoms, and

X and Y each independently is oxygen or sulphur.

9. A method of combating arthropods which comprises applying to said arthropods, or to a habitat thereof, an arthropodicidally effective amount of a compound according to claim **1**.

4,120,957
BIS-PHOSPHORAMIDATES

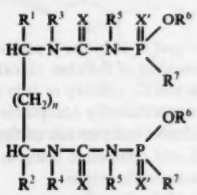
Ernest D. Weiler, Ambler; W. David Weir, Levittown, and Martha Wolfersberger, Perkasie, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 699,830, Jun. 25, 1976, abandoned. This application Jun. 3, 1977, Ser. No. 803,181

Int. Cl.[2] **A01N** *9/36;* **C07F** *9/22*

U.S. Cl. 424—204 **26 Claims**

1. A compound of the formula:



wherein R^1 and R^2 are the same or different groups selected from hydrogen, (C_1–C_6) alkyl, aralkyl of up to 11 carbon atoms or (C_6–C_{10}) aryl; and when *n* is an integer of 0 to 2, R^1 and R^2 can be joined together with the alkylene chain to which they are attached to form cyclohexyl; R^3 and R^4 are the same or different groups selected from hydrogen, unsubstituted (C_1–C_6) alkyl, (C_1–C_6) haloalkyl, (C_1–C_6) hydroxy alkyl, (C_1–C_6) alkoxyalkyl, (C_1–C_6) nitroalkyl, (C_3–C_8) alkenyl, (C_3–C_8) alkynyl, phenylalkynyl, (C_3–C_8) cycloalkyl, (C_4–C_{12}) cycloalkylalkyl, cycloalkenylalkyl, ferrocenemethyl, aryl, optionally substituted aralkyl or aralkenyl of up to 11 carbon atoms, wherein the substituent is one or more substituents selected from (C_1–C_3) alkyl, (C_1–C_3) alkoxy, (C_1–C_3) alkylthio, di-(C_1–C_3) alkylamino, cyano, nitro or halo, R^5 is selected from hydrogen, (C_1–C_6) alkyl, (C_3–C_6) alkenyl, (C_3–C_8) cycloalkyl, (C_4–C_{12}) cycloalkylalkyl, optionally substituted aralkyl of up to 11 carbon atoms, optionally substituted (C_6–C_{10}) aryl wherein the substituent is one or more substituents selected from (C_1–C_3) alkyl, (C_1–C_3) alkoxy, (C_1–C_3) alkylthio, di-(C_1–C_3) alkylamino, cyano, nitro or halo, R^6 is selected from (C_1–C_4) alkyl; (C_2–C_8) alkoxyalkyl, (C_2–C_4) haloalkyl or optionally substituted (C_6–C_{10}) aryl wherein the substituent is one or more substituents selected from (C_1–C_3) alkyl, (C_1–C_3) alkoxy, (C_1–C_3) alkylthio, di-(C_1–C_3) alkylamino, cyano, nitro or halo; R^7 is selected from (C_1–C_3) alkoxy, (C_1–C_3) alkylthio, optionally substituted (C_6–C_{10}) aryloxy or optionally substituted (C_6–C_{10}) arylthio wherein the substituent is one or more substituents selected from (C_1–C_3) alkyl, (C_1–C_3) alkoxy, (C_1–C_3) alkylthio, di-(C_1–C_3) alkylamino, cyano, nitro or halo; X is oxygen or sulfur, X′ is oxygen or sulfur and *n* is an integer of 0 to 10 provided that when R^7 is alkoxy and *n* is 0, at least one of the R^1, R^2, R^3 and R^4 groups is other than hydrogen, the $(CH_2)_n$ group may be substituted with alkyl, hydroxy, alkoxy or aryl and the pharmaceutically acceptable metal salts and metal salt complexes thereof.

10. An anthelmintic composition for oral administration comprising an anthelmintically effective amount of a compound, metal salt, or metal salt complex, of claim **1** and a pharmaceutically acceptable carrier.

4,120,958
NOVEL 2-ACETOXYBENZOIC ACID-NICOTINAMIDE COMPLEXES

Anwar A. Hussain, Lexington, Ky., assignor to Interx Research Corporation, Lawrence, Kans.

Filed Mar. 11, 1977, Ser. No. 776,933

Int. Cl.[2] **A61K** *31/625;* **C07D** *213/81, 213/82*

U.S. Cl. 424—232 **10 Claims**

1. A 2-acetoxybenzoic acid complex of the formula:

$$A \cdot N_{(x)}$$

wherein *A* represents 2-acetoxybenzoic acid; wherein *N* represents a member selected from the group consisting of nicotinamide and iso-nicotinamide; and wherein (*x*) represents an integer of about 1:1 to 1:2.

5. A method for inducing an analgesic, antipyretic and anti-inflammatory response in a warm-blooded animal, which comprises:

orally administering thereto a safe and effective amount of a complex of the formula:

$$A \cdot N_{(x)}$$

wherein *A* represents 2-acetoxybenzoic acid; wherein *N* represents a member selected from the group consisting of nicotinamide and iso-nicotinamide; and wherein (*x*) represents an integer of about 1:1 to 1:2, said complex being administered in combination with a pharmaceutically acceptable inert diluent.

4,120,959
LABILE QUATERNARY AMMONIUM SALTS USEFUL IN BINDING BILE ACIDS IN WARM-BLOODED ANIMALS

Nicolae S. Bodor, Lawrence, Kans., assignor to Interx Research Corporation, Lawrence, Kans.

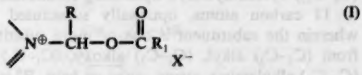
Division of Ser. No. 691,781, Jun. 1, 1976, Pat. No. 4,046,899. This application Jun. 24, 1977, Ser. No. 809,852

Int. Cl.[2] **A61K** *31/56, 31/415*

U.S. Cl. 424—238 **29 Claims**

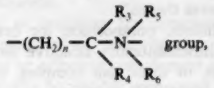
1. A method for substantially binding free and conjugated bile acids in a warm-blooded animal characterized as being ulcer-prone which comprises orally administering thereto, a

therapeutically effective bile acid binding amount of a compound having the formula:



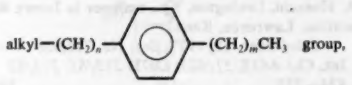
(I)

wherein >N represents an imidazolyl group; wherein R represents a member selected from the group consisting of a hydrogen atom, a C_1–C_{20} open chain or cyclo alkyl group, a C_1–C_{20} alkoxyalkyl group, a C_1–C_{20} alkanoyloxyalkyl group, a C_1–C_{20} haloalkyl group, a C_1–C_{20} carboxyalkyl group, a phenyl group, a naphthyl group, and a substituted phenyl or naphthyl group, whose substituents are selected from the group consisting of a halogen atom, an O—C_1–C_4 alkyl group, an O—C_1–C_8 alkanoyl group, a nitro group, a carboxyl group, and a carboethoxy group; wherein R_1, which may be the same or different, represents any member defined by R above with the proviso that R cannot be a hydrogen atom, a



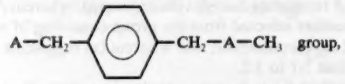
group,

wherein R_3, R_4, R_5 and R_6 are each selected from the group consisting of a hydrogen atom, a methyl group or an ethyl group, a C_1–C_{22} straight or branched



group,

wherein *n* in each occurrence and *m* represent an integer of from 0 to 22, an



group,

wherein A represents a C_1–C_{22} straight or branched alkyl group as above or a $-(CH_2CH_2O)_p$ group, wherein the *p* represents an integer of from 0 to 22, and the residue of any naturally occurring bile acid selected from the group consisting of cholic acid, deoxycholic acid, glycocholic acid and chenodeoxycholic acid; and wherein X represents a halogen atom, a methanesulfonate group, a fluorosulfonate group and a tosylate group.

4,120,960

THERAPEUTIC AGENTS

Norman W. Bristow, Wollaton; Peter E. Macey, Nottingham; Kenneth J. Nichol, West Bridgford, and Malcolm F. Sim, Woodborough, all of England, assignors to The Boots Company Limited, England

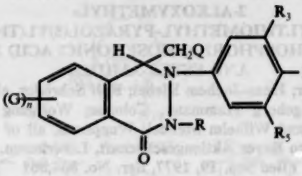
Continuation-in-part of Ser. No. 519,541, Oct. 31, 1974, abandoned, which is a continuation-in-part of Ser. No. 412,354, Nov. 2, 1973, abandoned. This application Aug. 1, 1977, Ser. No. 820,907

Claims priority, application United Kingdom, Oct. 31, 1973, 50623/73; Denmark, Apr. 26, 1974, 2297/74

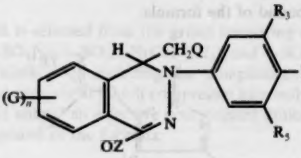
Int. Cl.[2] **C07D** *237/32;* **A61K** *31/50;* **C07D** *417/04*

U.S. Cl. 424—250 **29 Claims**

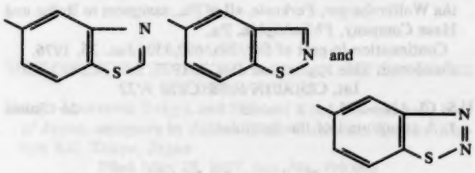
1. A therapeutic composition for inducing diuresis in mammals comprising a therapeutically effective diuretic amount of a compound of the formula:



or its enol form of the formula:

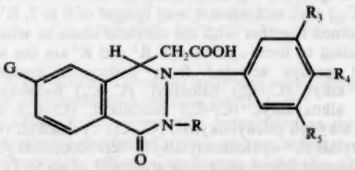


wherein Q is selected from the group consisting of COOH and CH_2OH, R is selected from the group consisting of hydrogen and C_{1-7} alkyl, Z is hydrogen or acetyl, R_5 is hydrogen, R_3 and R_4 are each independently selected from the group consisting of hydrogen, fluorine, chlorine, bromine, iodine, nitro, cyano, C_{1-7} alkyl, trifluoromethyl, 1-hydroxypropyl, methoxymethyl, phenyl, C_{1-4} alkoxy, C_{1-4} alkylthio, trifluorometylthio, phenylthio, methylsulphonyl, methylsulphinyl, acetyl, propionyl, trifluoroacetyl, benzoyl, thenoyl, hydroxy, sulphamoyl, N,N-dimethylsulphamoyl, N,N-diethylsulphamoyl, amino, N-methylamino, N,N-dimethylamino, N-ethylamino, N,N-diethylamino, N,N-methylethylamino, N-methylformamido, N-methylacetamido, N-methylmethanesulphonamido, N-methyl-p-toluenesulphonamido, 1-pyrrolyl, or R_3 and R_4 together form a portion of a heterocyclic ring fused to the benzene ring to form a group selected from the group consisting of:

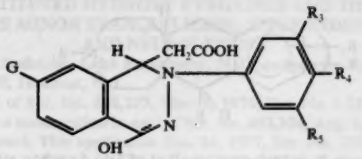


wherein *n* is 0 or 1 and G is in the 7-position and is selected from the group consisting of fluorine, chlorine, bromine, C_{1-4} alkyl, C_{1-4} alkylthio and C_{1-4} alkoxy or is in the 6 position and is fluorine, or a pharmaceutically acceptable alkyl having 1 to 7 carbon atoms inclusive ester or salt of those compounds in which Q is COOH; said compound being in admixture with a pharmaceutically acceptable carrier.

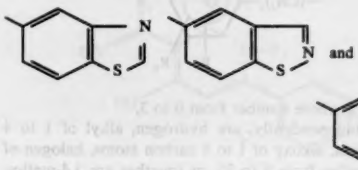
16. A compound of the formula:



or its enol form having the formula:



wherein, R is selected from the group consisting of hydrogen and C_{1-7} alkyl, R_5 is hydrogen, R_3 and R_4 together with the benzene to which they are attached form a fused ring system selected from the group consisting of:



and wherein G is selected from the group consisting of fluorine, chlorine, bromine, C_{1-4} alkyl and C_{1-4} alkoxy, and pharmaceutically acceptable salts and alkyl having 1 to 7 carbon atoms inclusive esters of these compounds.

4,120,961

RING SUBSTITUTED PYRAZINO-ISOQUINOLINE DERIVATIVES AND THEIR PREPARATION

Jürgen Seubert; Rolf Pohlke, both of Darmstadt; Herbert Thomas, and Peter Andrews, both of Wuppertal, all of Fed. Rep. of Germany, assignors to E. Merck, Fed. Rep. of Germany

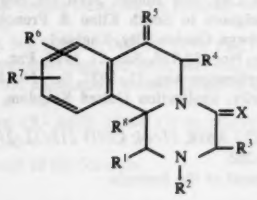
Division of Ser. No. 607,810, Aug. 26, 1975, Pat. No. 4,051,243. This application Jul. 20, 1977, Ser. No. 817,467

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1974, 2441261

Int. Cl.[2] **A61K** *31/495;* **C07D** *241/36*

U.S. Cl. 424—250 **22 Claims**

1. A compound of the formula



wherein R^1 is a hydrogen atom, hydroxy or alkyl; R^2 is

R^3 is a hydrogen atom, alkyl or hydroxyalkyl; R^4 is a hydrogen atom, alkyl or phenyl; R^5 is an oxygen atom, two hydrogen atoms, or a hydrogen atom and one of alkyl, phenyl, halogen atom, or hydroxy; R^6 and R^7, which can be alike or different, each are a hydrogen atom, a halogen atom, hydroxy, amino, nitro, cyano, alkyl, alkoxy, alkanoyloxy, monoalkylamino, dialkylamino, alkanoylamino, benzoyloxy; R^8 is a hydrogen atom or alkyl; R^9 is phenyl which is unsubstituted or mono- or di-substituted by a fluorine or chlorine atom, hydroxy, nitro, amino, monoalkylamino, dialkylamino or alkanoylamino; Hal is a fluorine, chlorine, bromine or iodine atom, X and Y, which can be the same or different, each is an oxygen or sulfur atom; alkyl, hydroxyalkyl, alkoxy and alkanoyl, unless otherwise indicated, in each instance being up to 4 carbon atoms; with the proviso that R^2 is

when R^1 and R^3 to R^8, inclusive, each are hydrogen atoms and X is an oxygen atom; and the physiologically acceptable salts thereof.

17. An anthelmintic composition comprising an anthelmintically effective amount per unit dosage of at least one compound of claim 1 in admixture with a pharmaceutically acceptable carrier or in admixture with an animal feed or feed concentrate.

4,120,962

FUSED PYRIMIDIN-4(3H)-ONES AS ANTIALLERGY AGENTS

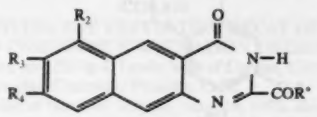
Thomas H. Althuis, Groton; Leonard J. Czuba, New London; Hans-Jurgen E. Hess, Old Lyme, and Saul B. Kadin, New London, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 667,515, Mar. 16, 1976, Pat. No. 4,044,134, which is a division of Ser. No. 485,945, Jul. 5, 1974, Pat. No. 3,974,161, which is a continuation-in-part of Ser. No. 444,138, Feb. 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 351,025, Apr. 13, 1973, abandoned. This application Apr. 11, 1977, Ser. No. 786,185

Int. Cl.[2] **C07D** *239/90;* **A61K** *31/505*

U.S. Cl. 424—251 **15 Claims**

1. A compound selected from the group consisting of



and the pharmaceutically-acceptable cationic salts thereof wherein

R° is selected from the group consisting of hydroxy, alkoxy having 1 to 4 carbon atoms, hydroxyalkoxy having 2 to 4 carbon atoms, amino and hydroxyamino;

each of R_2, R_3 and R_4 is selected from the group consisting of hydrogen, alkyl and alkoxy having 1 to 4 carbon atoms, halo, benzyloxy, hydroxy, thiol, alkanoyloxy having 1 to 4 carbon atoms, benzylthio, benzoyloxy, benzylsulfinyl, methylthio and methylsulfinyl and

R_2 and R_3, and R_3 and R_4 when taken together are selected from the group consisting of methylenedioxy and ethylenedioxy.

4,120,963

CERTAIN PYRIDO[3,4-B]INDOLE-1-ONES

Wolfgang Kampe, Heddesheim; Martin Senn, Eppelheim; Max Thiel, Mannheim; Wolfgang Bartsch, Viernheim, and Karl Dietmann, Mannheim-Vogelstang, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

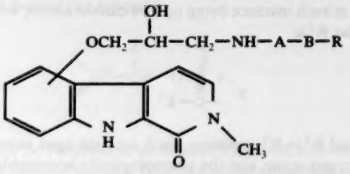
Filed May 19, 1977, Ser. No. 798,736

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1976, 2626889

Int. Cl.[2] **C07D** *471/14;* **A61K** *31/44*

U.S. Cl. 424—256 **8 Claims**

1. Aminopropanol compound of the formula



wherein

A is alkylene of from 2–6 carbon atoms,

B is sulfur or a valency bond,

R is a straight-chained or branched lower alkyl; and the pharmacologically compatible salts thereof.

4,120,964

APORPHINE DERIVATIVES

Johannes Hartenstein, Stegen-Wittental, and Gerhard Satzinger, Denzlingen, both of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

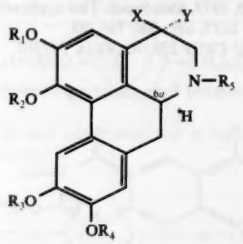
Filed May 25, 1977, Ser. No. 800,492

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1976, 2625116

Int. Cl.[2] A61K *31/47*; C07D *217/24*

U.S. Cl. 424—258 **8 Claims**

1. A compound of the formula:



(I)

wherein R_1, R_2, R_3 and R_4 which may be the same or different are lower alkyls of 1 to 3 carbon atoms; R_5 is hydrogen or a straight chained, cyclic or branched lower alkyl of up to 5 carbon atoms; and wherein X or Y in the trans position to the 6α-hydrogen atom is hydroxyl while the remaining X or Y symbol is hydrogen; with the proviso that when R_5 is methyl then at least one of R_1, R_2, R_3 or R_4 is ethyl, and the pharmaceutically acceptable acid addition salts thereof.

8. One compound according to "Phamaceutical compositions for the treatment of hypertension having an anti-hypertensive amount of a compound of claim 1, in admixture with a solid or liquid pharmaceutical diluent or carrier.

4,120,965

OCTAHYDRO-1,4-DIAZEPINO[1,7,b]ISOQUINOLINES

Gerhard Bormann, Munchenstein, and Richard Berthold, Bottmingen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

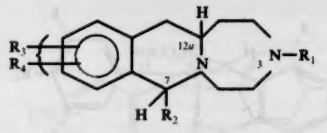
Continuation-in-part of Ser. No. 744,705, Nov. 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 639,945, Dec. 11, 1975, abandoned. This application May 19, 1977, Ser. No. 798,314

Claims priority, application Switzerland, May 19, 1976, 6255/76; Dec. 20, 1974, 17020/74

Int. Cl.[2] C07D *471/04*; A61K *31/47*

U.S. Cl. 424—258 **57 Claims**

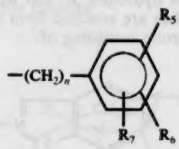
1. A compound of formula I,



I

wherein R_1 is hydrogen or alkyl of 1 to 5 carbon atoms,

R_2 is a group



wherein *n* is a whole number from 0 to 3,

R_5 and R_6, independently, are hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen of atomic number from 9 to 35, or together are 3,4-methylenedioxy,

R_7 is hydrogen, or when both R_5 and R_6 are alkoxy of 1 to 4 carbon atoms also may be alkoxy of 1 to 4 carbon atoms,

R_3 is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, or halogen of atomic number from 9 to 35, and

R_4 is hydrogen or alkoxy of 1 to 4 carbon atoms,

in free base form or in pharmaceutically acceptable acid addition salt form.

5. A pharmaceutical composition for use in treating aggression or inducing or promoting sleep comprising an effective amount of a compound according to claim 1 in association with a pharmaceutical carrier or diluent.

4,120,966

HETEROCYCLIC-METHYLTHIOETHYL-DITHIOCARBAMATES AND ISOTHIOUREAS

Thomas Henry Brown, Welwyn Garden City; Graham John Durant, Welwyn Garden City; Charon Robin Ganellin, Welwyn Garden City, and Robert John Ife, Stevenage, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

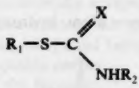
Division of Ser. No. 652,925, Jan. 27, 1976, Pat. No. 4,056,621. This application Aug. 11, 1977, Ser. No. 823,559

Claims priority, application United Kingdom, Feb. 3, 1975, 4538/75

Int. Cl.[2] A61K *31/44*; C07D *213/52, 213/53*

U.S. Cl. 424—263 **4 Claims**

1. A compound of the formula:



wherein R_1 represents a grouping of the structure

$$\text{Het} - CH_2S(CH_2)_2-$$

wherein Het is a pyridine, ring, which ring is optionally substituted by lower alkyl, lower alkoxy or halogen R_2 is hydrogen, lower alkyl or the same as R_1; X is sulphur, =NH or =NCN; or a hydrate or pharmaceutically acceptable acid addition salt or hydrated salt thereof.

4. A method of blocking histamine H_2-receptors which comprises administering to an animal in an effective amount to block said receptors a compound of claim 1.

4,120,967

SUBSTITUTED HYDROXY PYRIDONES AND THEIR USE AS MINOR TRANQUILIZERS, SLEEP INDUCERS AND NEUROLEPTICS

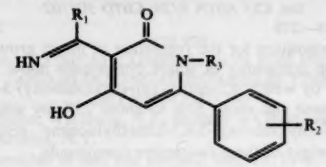
Jeffrey Nadelson, Lake Parsippany, N.J., assignor to Sandox, Inc., E. Hanover, N.J.

Division of Ser. No. 664,237, Mar. 5, 1976, Pat. No. 4,024,262, which is a continuation-in-part of Ser. No. 602,324, Aug. 6, 1975, abandoned. This application Jan. 14, 1977, Ser. No. 759,399

Int. Cl.[2] A61K *31/44;* C07D *213/44*

U.S. Cl. 424—263 3 Claims

1. A method of inducing sleep which comprises administering to a mammal in need of said treatment a sleep-inducing effective amount of a compound of the formula



where

R_1 represents lower alkyl having 1 to 4 carbon atoms or cycloalkyl having 3 to 6 carbon atoms,

R_2 represents hydrogen, halo having an atomic weight of about 19 to 36, lower alkyl or alkoxy, and

R_3 represents straight chain lower alkyl, or a pharmaceutically acceptable salt thereof.

4,120,968

HETEROCYCLIC ALKYLAMINOCYCLOBUTENEDIONES

Charon Robin Ganellin, Welwyn Garden City, and Rodney Christopher Young, Bengeo, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

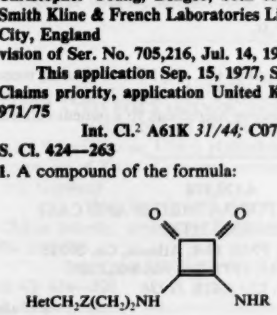
Division of Ser. No. 705,216, Jul. 14, 1976, Pat. No. 4,062,863. This application Sep. 15, 1977, Ser. No. 833,404

Claims priority, application United Kingdom, Jul. 31, 1975, 31971/75

Int. Cl.[2] A61K *31/44;* C07D *213/36*

U.S. Cl. 424—263 6 Claims

1. A compound of the formula:



wherein R is hydrogen, lower alkyl or $(CH_2)_2Z'CH_2Het'$; Z and Z' may each be sulphur or methylene; and Het is a pyridine ring optionally substituted by hydroxy, methoxy, chloro or bromo Het' is a pyridine ring optionally substituted by hydroxy, methoxy, chloro or bromo, a thiazole ring or an isothiazole ring or Het' may be an imidazole ring optionally substituted by methyl or bromo; or a pharmaceutically acceptable acid addition salt thereof.

6. A method of blocking histamine H_2-receptors which comprises administering to an animal in an effective amount to block said receptors a compound of claim 1.

4,120,969

HETEROCYCLIC ANALGETIC AND ANTIDIARRHEAL COMPOUNDS

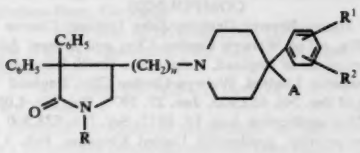
William John Welstead, Jr., Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Continuation-in-part of Ser. No. 615,952, Sep. 23, 1975, abandoned, which is a continuation-in-part of Ser. No. 541,684, Jan. 16, 1975, abandoned. This application May 12, 1977, Ser. No. 796,264

Int. Cl.[2] C07D *401/06*

U.S. Cl. 424—267 34 Claims

1. A compound selected from 1-R-4-(omega-substituted alkyl)-3,3-diphenyl-2-pyrrolidinones of the formula:



wherein;

R is selected from the group consisting of hydrogen, lower-alkyl, cyclohexyl and benzyl,

R^1 is selected from the group consisting of hydrogen, chloro, bromo, fluoro, trifluoromethyl and lower-alkoxy,

R^2 is selected from the group consisting of hydrogen, chloro, bromo and fluoro,

A is selected from the group consisting of lower-alkylcarbonyloxy and lower-alkoxycarbonyl, and *n* is 1, 2 or 3.

4,120,970

COMPOSITION FOR PREVENTING DECAY OF FRUIT AND INHIBITING SPORULATION THEREON

John R. Bice, and Philip J. Lewis, both of Corona, Calif., assignors to Brogdex Company, Pomona, Calif.

Continuation of Ser. No. 253,195, May 15, 1972, abandoned, which is a continuation-in-part of Ser. No. 53,996, Jul. 10, 1970, Pat. No. 3,674,510. This application Dec. 27, 1973, Ser. No. 428,930

Int. Cl.[2] A23L *3/34*

U.S. Cl. 424—270 5 Claims

1. A synergistic composition which simultaneously inhibits decay of citrus fruit by molds and fungi and prevents sporulation of said molds and fungi without adversely affecting the appearance and fitness for comsumption of the fruit, said composition containing as active ingredients 2-(4-thiazolyl) benzimidazole and an alkali metal salt of orthophenyl pheonl tetrahydrate, the alkali metal being selected from the group consisting of sodium and potassium, the weight ratio of 2-(4-thiazolyl) benzimindazole to the alkali metal salt of ortho-phenyl phenol tetrahydrate, expressed as ortho-phenyl phenol, being 1:0.5–15.

4,120,971

NOVEL N-CARBOXY-ALPHA-AMINO ACID ANHYDRIDES

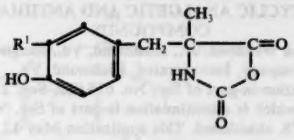
Walfred S. Saari, and Joel R. Huff, both of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 1, 1977, Ser. No. 773,258

Int. Cl.[2] A61K *31/42*

U.S. Cl. 424—272 5 Claims

1. Method of treating hypertension which comprises administering an antihypertensive amount of compound having the formula



wherein R^1 is H or hydroxy to a hypertensive patient.

4,120,972

IMIDAZOLYLMETHYLTHIO-ETHYL ISOTHIOUREA COMPOUNDS

Thomas Henry Brown; Graham John Durant; Charon Robin Ganellin, all of Welwyn Garden City, and Robert John Ife, Stevenage, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

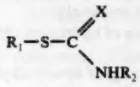
Division of Ser. No. 652,925, Jan. 27, 1976, Pat. No. 4,056,621. This application Aug. 11, 1977, Ser. No. 823,560

Claims priority, application United Kingdom, Feb. 3, 1975, 4538/75

Int. Cl.[2] A61K *31/415*; C07D *233/64*

U.S. Cl. 424—273 R **7 Claims**

1. A compound of the formula:



wherein R_1 represents a grouping of the structure

$$Het - CH_2S(CH_2)_2-$$

wherein

Het is an imidazole ring, which ring is attached at a ring carbon atom and is optionally substituted by lower alkyl, lower alkoxy or halogen;

R_2 is hydrogen, lower alkyl or the same as R_1; X is =NH or =NCN; or a hydrate or pharmaceutically acceptable acid addition salt or hydrated salt thereof.

6. A pharmaceutical composition to block histamine H_2-receptors comprising in an effective amount to block said receptors a compound of claim 1 in combination with a pharmaceutically acceptable diluent or carrier.

4,120,973

IMIDAZOLYL ALKYLAMINOCYCLOBUTENEDIONES

Charon Robin Ganellin, Welwyn Garden City, and Rodney Christopher Young, Bengeo, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

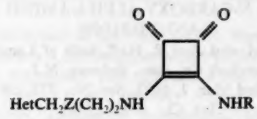
Division of Ser. No. 705,216, Jul. 14, 1976, Pat. No. 4,062,863. This application Sep. 15, 1977, Ser. No. 833,403

Claims priority, application United Kingdom, Jul. 31, 1975, 31971/75

Int. Cl.[2] C07D *233/64*; A61K *31/415*

U.S. Cl. 424—273 R **9 Claims**

1. A compound of the formula:



wherein R is $(CH_2)_2Z'CH_2Het'$; Z and Z' may each be sulphur or methylene; and Het and Het' may each be an imidazole ring attached at a ring carbon and optionally substituted by methyl or bromo; or a pharmaceutically acceptable acid addition salt thereof.

9. A method of blocking histamine H_2-receptors which comprises administering to an animal in an effective amount to block said receptors a compound of claim 1.

4,120,974

CERTAIN EPOXY COMPOUNDS IN ADMIXTURE AS INSECT REGULATING AGENTS

Georg Fráter, Greifensee; Albert Pfiffner, Bülach; Milos Suchy, Pfaffhausen, and René Zürflub, Bülach, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 27, 1976, Ser. No. 755,362

Claims priority, application Austria, Jan. 9, 1976, 105/76

Int. Cl.[2] A01N *9/28*; C07D *303/02*

U.S. Cl. 424—278 **3 Claims**

1. A composition for the regulation of insect growth, said composition containing as active compounds about 50% to about 75% by weight 6,7-epoxy-1-(p-ethylphenoxy)-3-ethyl-7-methyl-nonane and about 50% to about 25% by weight 6,7-epoxy-1-(p-ethylphenoxy)-3,4,7-trimethylnonane relative to the total weight of these two active compounds.

4,120,975

METHOD OF PSYCHIATRIC CONDITIONS

Thomas Samuel Campbell Orr, Melton Mowbray, and Patrick John Kingsley, Belton, Nr. Loughborough, both of England, assignors to Fisons Limited, London, England

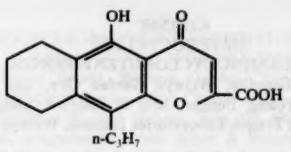
Continuation-in-part of Ser. No. 717,875, Aug. 26, 1976, Pat. No. 4,067,992. This application Sep. 8, 1977, Ser. No. 831,537

Claims priority, application United Kingdom, Sep. 15, 1976, 38101/76; Jun. 25, 1977, 26732/77

Int. Cl.[2] A61K *31/35*

U.S. Cl. 424—283 **10 Claims**

1. A method of treatment of psychiatric conditions in mammals which method comprises administration of an effective amount of a compound of the formula I,



I

or a therapeutically acceptable salt, alkyl C 1 to 10 ester, monoalkyl C 1 to 10 amide, di-alkyl C 1 to 10 amide or an unsubstituted amide thereof, as active ingredient, to a patient suffering from such a condition.

4,120,976

TREATMENTS FOR ARTHRITIS AND CAST DERMATITIS

Thomas A. Hosick, Box PMB 12-8, Atlanta, Ga. 30315

Filed Dec. 13, 1977, Ser. No. 860,126

Int. Cl.[2] A61K *31/36*

U.S. Cl. 424—282 **8 Claims**

1. A method for the treatment of arthritis comprising administering to arthritics for the relief of symptoms accompanying arthritis a member selected from the group consisting of 3,4-methylenedioxyamphetamine and its non-toxic acid addition salts in dosage amounts of approximately 0.2 to 1.5 milligrams per kilogram of body weight.

6. A method for the treatment of symptoms accompanying cast dermatitis of those afflicted comprising administering to the afflicted approximately 1.5 milligrams of a member selected from a group consisting of 3,4-methylenedioxyamphetamine and its non-toxic acid addition salts per killogram of body weight.

4,120,977

METHOD OF AND FEED FOR FARMING MEAT POULTRY ESPECIALLY CHICKENS AND GUINEA FOWL

Germano Cagliero, Ivrea (Turin), Italy, assignor to Marxer, S.p.A., Loranze d'Ivrea, Italy

Filed Apr. 7, 1977, Ser. No. 785,457
Claims priority, application Italy, Apr. 23, 1976, 67988 A/76
Int. Cl.[2] A23K *1/17*
U.S. Cl. 424—285 6 Claims

1. A method for promoting the growth rate of broilers and guinea fowl meat poultry, comprising feeding healthy poultry with a feed containing from 10 to 25 ppm of nifuroxazide.

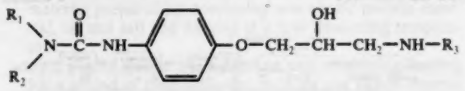
4,120,978

PHARMACEUTICAL COMPOSITION FOR INHIBITING AND BLOCKING CARDIOSELECTIVE BETA-RECEPTORS

Max Wilhelm, Watchung, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 639,683, Dec. 11, 1975, Pat. No. 4,038,313, which is a continuation of Ser. No. 361,373, May 17, 1973, Pat. No. 3,935,259, which is a continuation-in-part of Ser. No. 101,393, Dec. 24, 1970, abandoned. This application Apr. 4, 1977, Ser. No. 784,893
Claims priority, application Switzerland, Jan. 8, 1970, 204/70
Int. Cl.[2] A61K *31/17*
U.S. Cl. 424—322 2 Claims

1. A pharmaceutical composition for inhibiting and blocking cardioselective Beta-receptors which comprises a therapeutically effective amount of an 1-ureidophenoxy-2-hydroxy-3-aminopropane of the formula



wherein R_1 denotes hydrogen, R_2 denotes cycloalkyl having 4 to 7 ring members and R_3 denotes lower alkyl or a therapeutically usable acid addition salt of such a compound together with a pharmaceutical carrier.

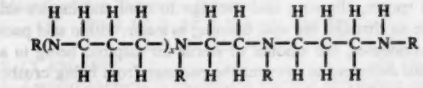
4,120,979

ALKYLATED POLYAMINES, THEIR PREPARATION AND USE AS MICROBIOCIDES

Günter Schwarzmann; Ulrich Holtschmidt, and Günter Bertelmann, all of Essen, Germany, assignors to Th. Goldschmidt AG, Germany

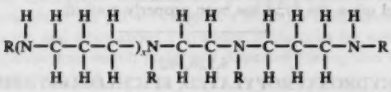
Filed Sep. 6, 1977, Ser. No. 830,772
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1976, 2641836
Int. Cl.[2] A01N *9/20*; C07C *87/14, 87/20*
U.S. Cl. 424—325 9 Claims

1. A compound or mixture of compounds having the general formula



in which R is hydrogen or an alkyl group containing 8 to 18 carbon atoms, at least one R being alkyl, and x is 0 or 1.

4. A process for killing microbes which comprises contacting said microbes with a microbiocidally effective amount of a compound or mixture of compounds having the formula



in which R is hydrogen or an alkyl group containing 8 to 18 carbon atoms, at least one R being alkyl, and x is 0 or 1.

4,120,980

PROTEIN-RICH FOODSTUFFS FOR RUMINANTS

Norbert Merget, Bochum, and Friedhelm Koch, Dülmen, both of Germany, assignors to Veba Chemie Aktiengesellschaft, Gelsenkirchen-Buer, Germany

Filed Sep. 8, 1976, Ser. No. 721,631
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1975, 2540457
Int. Cl.[2] A23L *1/18, 1/22*
U.S. Cl. 426—69 4 Claims

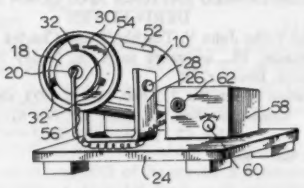
1. A foodstuff or foodstuff supplement for ruminants comprising a particulate proteinaceous feed material of vegetable, animal or synthetic origin, the surface of the particle thereof having been treated with a member selected from the group consisting of an aldehyde and a vinyl or acrylic polymer whereby the proteinaceous component is substantially resistant to digestion in the rumen of a ruminant but digestable in the small intestines of said ruminant and a non-proteinaceous nitrogen compound, said compound being present in a weight equivalent ratio of 0.1 to 10.0 with respect a nitrogen equivalent content of said particulate proteinaceous feed material.

4,120,981

METHOD OF COOKING FOOD

William H. Burkhart, Room 190, 960 San Antonio Rd., Los Altos, Calif. 94022

Division of Ser. No. 568,864, Apr. 17, 1975, Pat. No. 4,048,473. This application Oct. 2, 1975, Ser. No. 618,779
Int. Cl.[2] A01K *43/00*; G01N *33/02*
U.S. Cl. 426—231 27 Claims



1. A method of cooking food which comprises tumbling the food in the presence of some liquid in a rotating vessel that is liquid-impervious except for a vent opening in a removable cap closing one end of the vessel and thereby stirring the contents of the vessel, distributing the liquid over a substantial portion of the inner surface of the vessel and promoting an even temperature distribution of the vessel contents, preselecting a desired temperature for the food to be cooked applying heat to the contents of the vessel sufficient to cause gases to be evolved, venting said gases from the vessel through said vent opening while the vessel is rotated with heat applied thereto and while retaining in the vessel the distributed liquid that is not gasified and vented, measuring the temperature of the evolved gases and thereby effectively measuring the surface temperature of the food and the temperature of the liquid in the vessel, automatically controlling the heat applied in accordance with the measured temperature of said gases, and automatically producing a signal when said pre-selected temperature is reached in order that the applicaton of heat may thereaf-

ter be reduced sufficiently to terminate cooking of food in the vessel when the food has been properly cooked.

4,120,982

HYDROXYPROPYLATED, EPICHLOROHYDRIN CROSSLINKED TAPIOCA STARCH DERIVATIVE FOR ACID RETORT MEDIA

James E. Eastman, and Frank del Valle, both of Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Continuation of Ser. No. 112,817, Feb. 4, 1971, abandoned. This application Sep. 22, 1975, Ser. No. 615,334

Int. Cl.[2] A23L *1/10, 3/02*

U.S. Cl. 426—405 **3 Claims**

1. A method of continuous retort canning particularly adapted for canning bland or delicately flavored foods in an acid medium, the steps comprising:

(a) preparing a 5–8% by weight dry solids aqueous slurry of a hydroxypropylated, epichlorohydrin crosslinked tapioca based starch derivative, said starch derivative having a degree of substitution of hydroxypropyl units of about 0.08–0.3 and having a level of crosslinking with epichlorohydrin sufficient to obtain an alkali fluidity ranging from 71–98 ml. for test sample containing 3 grams of the starch derivative in water to make 10 ml., plus 90 ml. of 0.375N NaOH;

(b) combining said aqueous slurry with a food material;

(c) adjusting the pH of said slurry to a range of 3–5;

(d) disposing the aqueous starch slurry and the food material in a plurality of containers;

(e) sealing said containers;

(f) heating the starch slurry and food materials sealed in said containers to a temperature of at least 210° F. without degrading the starch derivative for a period of 8–20 minutes to effect sterilization of the starch slurry and food materials sealed in said containers; and

(g) simultaneously moving said containers with agitation while heating to effect a uniform suspension of the food materials throughout the starch slurry after heating.

4,120,983

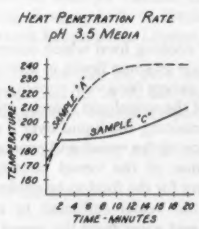
HYDROXYPROPYLATED, EPICHLOROHYDRIN CROSSLINKED TAPIOCA AND CORN STARCH DERIVATIVES

Frank del Valle; John V. Tuschhoff, and Charles E. Streaty, all of Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Continuation of Ser. No. 112,660, Feb. 4, 1971, abandoned. This application Sep. 22, 1975, Ser. No. 615,629

Int. Cl.[2] A23L *1/10, 3/02*

U.S. Cl. 426—405 **5 Claims**



1. In the method of continuous retort canning and sterilizing food products in individual sealed containers in which internal food mass temperatures of at least 210° F. are attained within about 10 to 20 minutes after the initiation of the food product heating cycle, and the food product including the starch derivative is first canned and sealed prior to sterilization, the improvement comprising the step of using as a principal food retort medium a hydroxypropylated, epichlorohydrin crosslinked starch derivative derived from a starch selected from the group consisting of corn starch and tapioca starch, said starch derivative having a degree of substitution of hydroxypropyl units of about 0.085–0.3, and having been subjected to epichlorohydrin cross-linking to obtain an alkali fluidity ranging from 45–70 cm^3. for a 3 gram sample in 0.375 N NaOH of the tapioca derivative and ranging from 60–90 cm^3. for a 4 gram sample with 0.375 N NaOH of the corn starch derivative, said starch derivative having an initial Brookfield viscosity before retort processing of less than about 1,100 centipoise when slurried in a retort medium having a pH of 3–7 and comprising about 50 gm. d.s.b. starch/1,000cm^3. water, and a final Brookfield viscosity of at least 3,000 to 7,000 centipoise after retorting said medium in said sealed containers with tumbling action for about 15–20 minutes by means of a heat source capable of raising the internal temperature of the retort medium to at least 210° F. to 240° F. said retort medium having a heat penetration rate without degrading the starch derivative such that the internal temperature of said retort medium is capable of attaining a temperature of at least 210° F. to 240° F. after heating under retort conditions for 8–12 minutes.

4,120,984

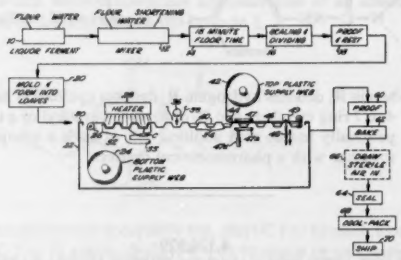
PROCESS FOR PREPARING FOOD IN THE PACKAGE

Donald G. Richardson, Shorewood, and Richard G. Hans, Edina, both of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed Oct. 27, 1976, Ser. No. 736,039

Int. Cl.[2] B65B *25/16, 25/22*

U.S. Cl. 426—412 **6 Claims**



1. A process of baking foods in flexible containers comprising providing a flexible package that is a barrier to microorganisms and is capable of withstanding baking temperatures, placing the farinaceous food product in the package, sealing the package to provide a filled package, maintaining a vent opening in said flexible package to allow the escape of steam and gas during baking, plaing the package in a baking oven and exposing it to heat for a sufficient period of time to bake or to cook the food product and generate steam to fill the space within the package, excess steam being allowed to escape through the vent opening, providing a source of sterile air free from viable mold spores, allowing said package to cool and inspire said sterile air through the vent opening as steam within said package condenses, the amount of sterile air inspired being in an amount sufficient to prevent the package from being crushed by the atmospheric pressure when the vapor condenses within the package, thereafter sealing the vent opening to completely seal the package to contain said condensed moisture generated during baking and the inspired sterile air whereby a package of bakery goods is provided which is free from mold for a period of 120 days storage at room temperature.

4,120,985
SULFUR-CONTAINING FLAVORING AGENTS

Steven van den Bosch, Woudenberg, Netherlands, assignor to P.F.W. Beheer B.V., Amersfoort, Netherlands

Filed May 12, 1976, Ser. No. 685,874

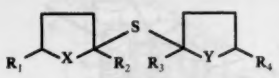
Claims priority, application United Kingdom, Jun. 9, 1975, 24720/75

Int. Cl.[2] A23L *1/231;* **C07D** *307/20, 307/64, 333/34*

U.S. Cl. 426—535 **14 Claims**

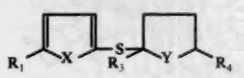
1. A chemical compound having a structural formula selected from the class consisting of

a)



and

b)



wherein X and Y are oxygen or sulfur; and wherein R_1, R_2, R_3, and R_4 are hydrogen or a 1 to 3 carbon alkyl group.

4,120,986
WHOLE EGG REPLACER

Charles Carl Lynn, Longwood, Fla., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 664,113, Mar. 5, 1976, abandoned. This application Jun. 28, 1977, Ser. No. 810,706

Int. Cl.[2] A21D *13/00;* **A23L** *1/32*

U.S. Cl. 426—549 **18 Claims**

1. The process of preparing a whole egg replacer base comprising the steps of:

providing from about 40% to 95% of a high protein content material prepared by combining non-elastic protein material, oil and salt and heating at a low simmering temperature,

adding a mild acid to the foregoing and continuing heating for a period of time sufficient to bring out flavor characteristics,

adding water and vegetables and boiling;

adding additional water and non-elastic protein material and continuing boiling,

adding a thickening agent and continuing boiling to obtain a material of high protein content; and,

adding to the high protein content material:

food grade emulsifier	2–12% (active ingredient basis)
a gum	0.75–1.5%
pregelatinized starch	4–12%
dextrin	2–12%
lecithin	0–12%
appearance agent	0–15%
texturizing agent selected from the group consisting alginate, carrageenan and mixtures thereof	0–4%
neutralizer	0–5%

all percentages being by weight.

4,120,987
AERATED CONFECTIONS

Carl Orville Moore, Rochester, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Jul. 5, 1977, Ser. No. 812,539

Int. Cl.[2] A23G *3/00*

U.S. Cl. 426—572 **21 Claims**

1. Aerated confection having the textural and eating qualities of grained, aerated confections, said aerated confection comprising:

(a) a continuous, stable homogeneous external aqueous film phase comprising from about 10% to about 25% by weight water, from about 25 to about 250 parts by weight sweetening agent, one part by weight water-soluble protein hydrolyzate characterized as being soluble in water throughout the pH 4–7 range at a 20% dry solids concentration and from about 2 to about 20 parts by by weight high-amylose starch uniformly dispersed throughout said film phase, and

(b) a discontinuous internal phase of minute gas bubbles homogeneously dispersed and entrapped by the continuous external film phase in an amount sufficient to provide an aerated confection having density of less than 0.75 gms/ml.

4,120,988
PROTEIN SNACK PRODUCT OF IMPROVED STRUCTURAL INTEGRITY

David T. Hahn, St. Louis, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

Filed Sep. 19, 1977, Ser. No. 834,755

Int. Cl.[2] A23L *1/34;* **A23J** *3/00*

U.S. Cl. 426—573 **3 Claims**

1. A method for making an improved fat fried puffed protein snack product comprising:

(a) preparing an aqueous slurry consisting essentially of water and at least20% by weight of oilseed protein isolate;

(b) mechanically working the slurry under ambient conditions into a fully hydrated irreversible, plastic gel;

(c) forming the gel into a desired shape;

(d) cooling the shaped gel sufficiently to form ice crystals of the free water;

(e) drying the formed and cooled gel to from 5 to 20% moisture; and

(f) deep fat frying the dried gel to produce said product.

4,120,989
HIGH PROTEIN PASTA FORMULATION

Donald A. Grindstaff, Rochester, Minn., and John R. Eterno, Lemont, Ill., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Nov. 1, 1976, Ser. No. 737,311

Int. Cl.[2] A23L *1/16*

U.S. Cl. 426—577 **13 Claims**

1. A high protein pasta which will not craze upon drying and storage consisting essentially of from about 80% to about 95% flour, from about 0 to about 8% soy protein isolate and from about 5 to about 20% of a whey protein concentrate/emulsifier composition consisting essentially of:

a. from about 90% to about 99% of a whey protein concentrate wherein at least 60% of the protein is denatured and,

b. from about 10% of about 1% food grade emulsifier.

4,120,990
POLYOXYALKYLENE PROPYLENE GLYCOL ESTERS FOR IMPROVED COOKING AND SALAD OIL

Paul Seiden, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 31, 1977, Ser. No. 783,085

Int. Cl.[2] A23D *5/00*

U.S. Cl. 426—601 **12 Claims**

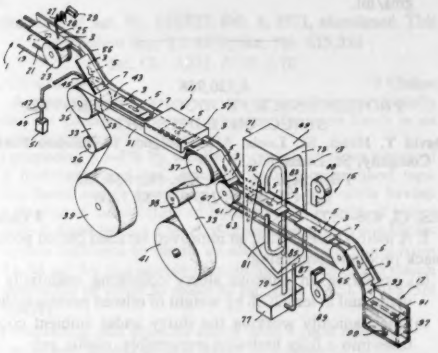
1. A cooking and salad oil composition having improved blendability in vinegar-and-oil salad dressings and low fat absorption in foodstuffs fried therein, said composition consisting essentially of a liquid glyceride base oil containing from about 0.005% to about 1.0% by weight of a polyoxyalkylene propylene glycol ester emulsifier containing from about 5 to about 35 oxyalkylene units per molecule and having a higher fatty acid portion in said ester of about 12 to about 22 carbon atoms.

4,120,991

PROCESS FOR MOUNTING TISSUE SECTIONS WITH AN U.V. LIGHT CURABLE MOUNTING MEDIUM

Leonard Ornstein, White Plains; Hazel Elizabeth Williams, Ossining, and Julius Intraub, Plainview, all of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Dec. 10, 1976, Ser. No. 749,557
Int. Cl.[2] G01N 1/28
U.S. Cl. 427—2 11 Claims



1. A method of mounting a stained thin section of a biological specimen, comprising the steps of: providing a thin layer of polymerizable material of low volatility over the surface of a solvent-wet specimen supported on a transparent substrate, so as to permeate said specimen, substantially totally evaporating the solvent in said specimen, covering said specimen subsequent to the evaporation of said solvent with a planar member which is oxygen-impermeable, and polymerizing said thin layer of material by exposure to U.V. radiation, said thin layer of material preventing damage to said specimen resulting from drying thereof prior to covering with said planar member, said thin layer of material further being transparent when polymerized.

4,120,992

ABRASION-RESISTANT OPTICAL ELEMENT

Bernard L. Laurin, Ludlow; Don H. Rotenberg, Westboro, both of Mass., and Harry D. Crandon, Woodstock, Conn., assignors to American Optical Corporation, Southbridge, Mass.

Division of Ser. No. 644,710, Dec. 29, 1975, Pat. No. 4,049,868. This application Jun. 23, 1977, Ser. No. 809,497
Int. Cl.[2] B05D 3/02, 3/06, 3/10; G02B 1/10
U.S. Cl. 427—164 5 Claims

1. The process of coating an organic optical element with a transparent, abrasion-resistant surface coating comprising:

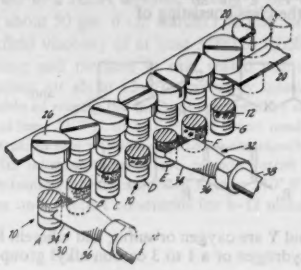
1. surface treating said organic optical element to promote adhesion of said abrasion-resistant surface coating,
2. applying to at least one surface of said organic optical element a mixture comprising a polysilicic acid ester of an alcohol containing from 1 to 12 carbon atoms, said ester having up to four silicic acid ester groups per silicon atom, a hydrolyzed vinyl polymer, a surface active agent and a cross-linking agent selected from the group consisting of formaldehyde, zirconyl nitrate, and mixtures thereof and
3. drying and curing said coating at an elevated temperature.

4,120,993

METHOD OF MAKING SELF-LOCKING FASTENERS

Richard Joseph Duffy, Salem, and Philip James Rodden, Beverly, both of Mass., assignors to USM Corporation, Farmington, Conn.

Continuation of Ser. No. 683,067, May 4, 1976, abandoned. This application Sep. 29, 1977, Ser. No. 837,897
Int. Cl.[2] B05D 3/02, 1/36
U.S. Cl. 427—195 6 Claims



1. In a method of providing a threaded surface of an article with a self-locking element comprising an adhered body of normally hard, tough, resilient resin including the steps of heating the threaded surface to a temperature above the softening point of said resin, thereafter directing a stream of fine particles of said resin to a selected area of said threaded surface while said threaded surface is at a temperature above said softening point, catching resin particles from said stream by softening them and causing them to be held on said threaded surface and to melt to a continuous resin body extending smoothly between generally axially extended edges of said area by heat from said threaded surface and solidifying said resin body, the improvement which comprises applying said resin particles in a plurality of spaced successive streams, controlling the rate at which and time during which resin particles of a first stream are directed to said threaded surface to form a deposit of a first portion of resin particles held on said threaded surface by heat softened resin and with exposed portions of said deposit retaining particulate character, said deposit of resin being in amount less than that desired in the self-locking element, maintaining said threaded surface at a temperature above said softening point for a time after completing deposition of said first portion of resin particles determined relative to the quantity and melting characteristics of the resin particles substantially completely to melt the deposited first portion of resin, thereafter directing a further stream of resin particles at the molten resin deposit where the particles are caught up and held by said molten resin to build up the quantity of resin on said threaded surface, coalescing the deposited resin to a substantially continuous body of resin extending smoothly between generally axially extending edges and cooling said body of resin to harden it to a solid body resistant to displacement and effective to give a locking action when a complementary threaded surface is assembled with said threaded surface.

4,120,994

METHOD OF PREPARING HEAT-TRANSFER MEMBERS

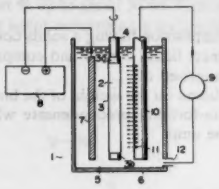
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Mar. 7, 1975, Ser. No. 556,203
Claims priority, application Japan, Mar. 11, 1974, 49-27077; Nov. 6, 1974, 49-127713; Nov. 29, 1975, 50-138062; Jan. 14, 1975, 50-6695
Int. Cl.[2] B05D 3/12
U.S. Cl. 427—239 6 Claims

1. A method of preparing a tubular heat transfer member having a porous metallic heat-transfer interface, said member

being tubing adapted to form an internal surface of a heat pipe having an evaporation zone, a condensation zone and an intermediate liquid transport zone, said method comprising the steps of

(a) mechanically roughening the surface of said member by providing said surface with a multitude of small cuts to a depth of at least 0.1mm so as to form in the evaporation and condensation zones a greater proportion of a multitude of small cuts extending essentially transverse to the axial direction of said tubing and in said intermediate



liquid transport zone a greater proportion of a multitude of small cuts extending essentially in parallel with the axis of said tubing; closely spaced from each other and uniformly distributed;

(b) disposing said surface of a substrate in contact with a solution containing a salt of a thermally conductive metal; and

(c) depositing said metal from said solution upon said substrate so as to form a dendritic metallic layer thereon constituting said porous heat-transfer interface.

4,120,995

PROCESS FOR BONDING A DURABLE LOW SURFACE ENERGY COATING

Peter Beverley Phipps, Saratoga; Bhim Sain Sharma, San Jose, both of Calif., and Anthony Wai Wu, Fishkill, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 18, 1977, Ser. No. 843,194
Int. Cl.[2] C23C *13/04*
U.S. Cl. 427—248 A **6 Claims**

1. A process for bonding a durable low surface energy coating to a metal or oxide surface, said process comprising maximizing the hydroxide ion concentration on the surface by treating said surface with an alkali, rigorously drying said surface, and then contacting the rigorously dry surface with a rigorously dry material having the formula

$$Rf - O - (CH_2)_n - SiX_3$$

wherein Rf is a fluorinated lower alkyl group, n in an integer from 2 to 10, and X is halogen, cyanide or alkoxy group, thereby condensing the fluorinated material with the hydroxide ions on said surface.

4,120,996

METHOD OF PROVIDING CORROSION RESISTANCE TO METAL SURFACES

Nicholas T. Castellucci, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 23, 1977, Ser. No. 799,880
Int. Cl.[2] B05D *3/10, 3/00, 1/38*
U.S. Cl. 427—318 **11 Claims**

1. An ecological method of providing corrosion resistance to metal surfaces, comprising:

(A) contacting the metal surface with an ascorbic acid-containing composition free of beta-diketones,

(B) rinsing the pretreated metal surface to remove excess treating composition,

(C) directly coating the pretreated metal surface with a film-forming material.

6. A method of providing improved corrosion resistance to a metal surface, comprising:

(A) contacting the metal surface with a composition obtained by mixing elemental molybdenum and ascorbic acid,

(B) rinsing the metal surface to remove excess treating composition,

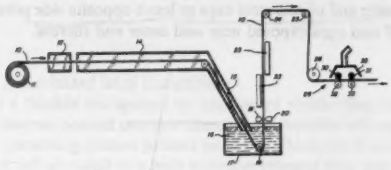
(C) directly coating the pretreated metal surface with a film-forming material.

4,120,997

PROCESS FOR PRODUCING ONE-SIDE GALVANIZED SHEET MATERIAL

Lawrence L. Franks, St. John, and David W. Gomersall, Valparaiso, both of Ind., assignors to Inland Steel Company, Chicago, Ill.

Filed May 11, 1976, Ser. No. 685,365
Int. Cl.[2] B05D *3/12*
U.S. Cl. 427—367 **10 Claims**



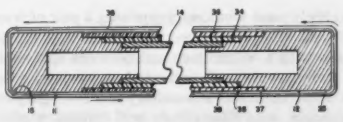
1. A process of making a one-side-only zinc coated ferrous metal strip comprising; continuously moving an endless ferrous metal strip through a zinc coating means which provides on one of the surfaces thereof a metallic zinc coating having a thickness which is adapted to protect the surface against corrosion while providing on the other surface of the said strip an ultra-thin metallic zinc film, moving said coated strip continuously through a heat treating zone in which heat is applied directly to only said ultra-thin metallic zinc film, heating said ultra-thin metallic zinc film in said heating zone until all of the zinc in said film is converted into a zinc-iron intermetallic surface film and discontinuing heating thereof before any significant increase in thickness occurs in the zinc-iron alloy intermetallic sub-surface layer associated with the said zinc coating, and removing completely the said zinc-iron intermetallic surface film from the surface of said strip by applying an abrading force thereto.

4,120,998

COMPOSITE STRUCTURE

Nejat A. Olez, St. Louis, Mo., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Feb. 3, 1977, Ser. No. 765,209
Int. Cl.[2] B32B *19/06*
U.S. Cl. 428—33 **6 Claims**



1. a cocured bonded structure characterized by its capability to collect multidirectional stress loads within a limited space envelope and transfer said loads to full composite section capable of withstanding said loads, comprising:

a. a pair of rigid strut caps,

b. each of said strut caps having a generally rectangular

outer end and an inner end, top and bottom stepped down sections extending from said outer end toward said inner end, and a section adjacent said inner end being relieved on all four sides,

c. a tubular rectangular strut positioned between said strut caps and fitting over said relieved inner end section of each said strut cap, said strut composed of a precured multidirectional fiber composite,

d. a plurality of straight layers of composite multidirectional oriented filaments extending between respective said top stepped sections of said strut caps, the first said layer contacting the top of said strut and the next, longer, layer contacting the top of the preceding layer,

e. a plurality of straight layers of composite multidirectional oriented filaments similarly extending between respective said bottom stepped sections of said strut caps,

f. a plurality of layers of hoop-wound unidirectional fibers wrapped around said outer ends of said strut caps from top to bottom along said preceding straight layers, and

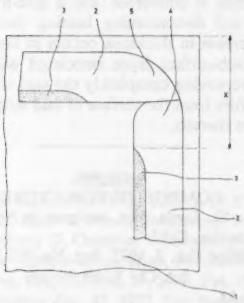
g. an outer wrap of woven fiber fabric surrounding the preceding structure at a right angle to said hoop-wound layers, said outer wrap being spaced inwardly from each outer end of said strut caps to leave opposite side portions of said caps exposed near said outer end thereof.

4,120,999

MULTIPLE PANE WINDOWS WITH IMPROVED SEALS

Pierre Chenel, Enghien les Bains, and Michel Jean Moncheaux, Chalon sur Saone, both of France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Jun. 29, 1976, Ser. No. 700,882
Claims priority, application France, Jul. 10, 1975, 75 21646
Int. Cl.[2] B32B *1/04;* E04C *2/34*
U.S. Cl. 428—34 **6 Claims**



1. A multiple pane window comprising a pair of transparent or translucent sheets arranged in generally parallel spaced relationship with a filamentary seal between said sheets adjacent the periphery thereof, said window having a plurality of sides and corners and said filamentary seal having a joint at one of said corners, said filamentary seal having a plurality of juxtaposed layers over the major portion of the length thereof, at least one layer containing a larger proportion of desiccant material and at least another layer containing a smaller proportion or no desiccant material, and said seal at said joint at one of the corners having only the layer or layers containing said smaller proportion or no desiccant material abutting each other.

4,121,000

COATING COMPOSITION COMPRISING A POLYSILOXANE RESIN-FORMING PRECONDENSATE, A FLUOROCARBON POLYMER, AN EPOXY RESIN, A SILICONE FLUID, AND AN INORGANIC HARDENING AGENT

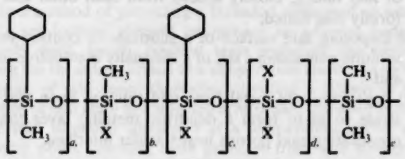
David K. Wald, Cherry Hill, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 664,233, Mar. 5, 1976. This application Jan. 23, 1978, Ser. No. 871,698
Claims priority, application Canada, Mar. 2, 1977, 272978
Int. Cl.[2] C08L *83/12*
U.S. Cl. 428—35 **12 Claims**

1. A coating composition having a solids content of 25–80% by weight in an inert liquid carrier and comprised of:

(a) a binder comprised of

(1) 40–93%, based on the weight of the binder, of a polysiloxane resin-forming precondensate which has one or more of the units



wherein

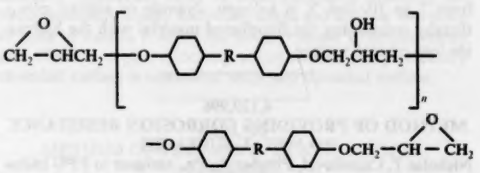
X is a functional group which allows cross-linking at its site, and

a, b, c, d and *e* are of a magnitude and in proportions which provide the resin with a degree of substitution, measured as the ratio of phenyl plus methyl groups to silicon atoms, of at least about 1.0, and a ratio of phenyl groups to silicon atoms of at least about 0.3,

and which has a silanol content above 4%, based on the weight of the precondensate;

(2) 5–50%, based on the weight of the binder, of a fluorocarbon polymer; and

(3) 2–40%, based on the weight of the binder, of an epoxy resin having the formula



wherein

n is an integer from 0–42, and

R is an alkylene group of 1–4 carbon atoms;

(b) 0.2–10%, based on the weight of the binder, of a silicone fluid which is a dimethyl polysiloxane fluid having a viscosity of 50–5000 centistokes measured at 25° C.;

(c) a finely divided inorganic hardening agent in a hardening agent-to-binder ratio of about 5/100 to 400/100; and

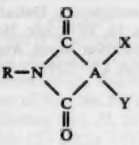
(d) a inert liquid carrier.

4,121,001
CROSSLINKING AGENT FOR POLYMERS AND WIRE CONSTRUCTION UTILIZING CROSSLINKED POLYMERS

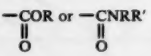
Alan J. Gotcher, Sunnyvale; Paul B. Germeraad, Palo Alto, and Viktors Jansons, Los Gatos, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Jan. 14, 1977, Ser. No. 759,473
Int. Cl.[2] B32B *15/00*; H01B *7/00*; C08F *2/46*
U.S. Cl. 428—35 **26 Claims**

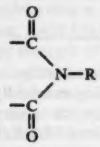
1. A composition comprising an organic crosslinkable polymer having a melt processing temperature of at least 200° and from about 0.1 wt % up to about 30 wt % of crosslinking agent said crosslinking agent comprising a compound of the formula



wherein X is hydrogen and Y is



and X and Y are substituents on adjacent carbon atoms of A or wherein X and Y together form the imide ring system



which is joined to A on adjacent carbons atoms, thereof, wherein A is an aromatic, heteroaromatic, alicyclic, or heterocyclic system or an open chain aliphatic moiety, where R is vinyl, allyl, methallyl or propargyl and wherein R′ is hydrogen, C_1 to C_{12} alkyl or R, or a mixture of said compounds.

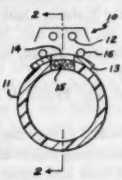
17. A formed article comprising an electrical conductor having as an insulating coating thereover the product of the process of crosslinking the composition of claim 1.

19. A shaped article comprising the composition of claim 1 in elongate substantially tubular form.

4,121,002
FABRICATION OF ANTENNA WINDOWS

R. Bruce Baldwin, Billerica, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 6, 1977, Ser. No. 813,393
Int. Cl.[2] H01Q *1/42*
U.S. Cl. 428—36 **5 Claims**

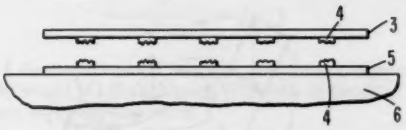


1. In a fiber-reinforced, resin matrix composite an antenna window comprising an opening in the composite having edges defining a predetermined shape, the opening being free of the resin matrix and containing the reinforcing fibers originally present in the composite prior to removal of resin to form the opening; and an electromagnetic-transparent resin filling the opening and being bonded to its edges and to the reinforcing fibers therein so that the resin is an integral part of the composite, lacking in joints and containing continuous reinforcing fibers.

4,121,003
TAMPER INDICATING LABELS

Frederick P. Williams, Kettering, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Apr. 22, 1977, Ser. No. 790,118
Int. Cl.[2] B32B *7/06*; G09F *3/02*
U.S. Cl. 428—40 **10 Claims**



1. A laminated label comprising:

(a) a flexible transparent or translucent plastic film, having reverse printed one side thereof a disruptable information containing pattern printed in an ink which ink is not fully dried or cured to a high cohesive integral film, and

(b) a layer of pressure sensitive adhesive bonded to the printed side of said plastic film,

the plastic film, the disruptable pattern, and the adhesive layer having relative affinities such that the affinity of the adhesive layer for the substrate to which it is applied, the affinity of the adhesive layer for the disruptable ink pattern, the affinity of the disruptable ink for the plastic film, the affinity of the disruptable ink for any conventional ink separating the disruptable ink from the adhesive layer or the cohesive strength of the adhesive layer all being greater than the cohesive strength of the disruptable pattern, with

the adhesive layer being formed from an adhesive which has at least one of the following characteristics:

(i) an adhesive which has an affinity for the surface to which the laminated label is adhered which is greater than the cohesive force of the adhesive layer,

(ii) an adhesive which has an affinity for the surface to which the laminated label is adhered greater than the affinity of the adhesive layer for said plastic film,

so that when the laminated label has been mounted on an object, attempted removal causes delamination of the label with at least a tamper indicating amount of the disruptable printed pattern remaining adhered to at least a portion of the pressure sensitive adhesive which remains on the object.

4,121,004
STRIP ROLL FOR USE IN DISPENSING TICKETS

Åke Ehrlund, Spånga, Sweden, assignor to AB Turn-O-Matic, Sundbyberg, Sweden

Division of Ser. No. 326,457, Jan. 24, 1973, Pat. No. 3,885,724. This application Nov. 4, 1974, Ser. No. 520,865
Int. Cl.[2] B65D *85/66*
U.S. Cl. 428—43 **2 Claims**

1. A strip roll for use in an assembly for dispensing tickets and which assembly has a tear-off device and from which the end of the strip roll protrudes comprising

a strip of flexible material from which single pieces of one and the same predetermined length are intended to be torn

off and having a pair of marginal edges and a feeding direction away from said roll,

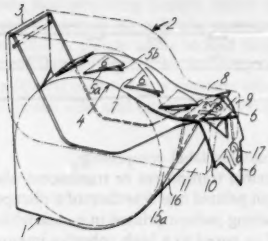
said strip having a series of longitudinally spaced apart penetrated lines,

each of said lines shaped and adapted to form an individual tongue shaped flap,

each of said lines starting from a point adjacent to but spaced inwardly of said strip from the first of said marginal edges and extending in said feeding direction of said strip toward the centerline thereof, and on the other side of said centerline extending back opposite said feeding direction of said strip to a point adjacent to but spaced inwardly from the second of said marginal edges of said strip,

said flaps equally spaced longitudinally along said strip with the longitudinal spacing between corresponding portions of adjacent flaps equal to said predetermined length,

the points at the ends of each of said penetrated lines lying on a straight line which is substantially perpendicular to



the longitudinal direction of the strip and with each flap firmly connected to the remainder of said strip along said straight line between said points,

the end of each of said flaps remote from said firmly connected portion having a width smaller than that of said firmly connected portion and with the smaller end of each flap directed forwards in said feeding direction of said strip and dimensioned to be gripped for pulling the strip and tearing a single end piece from said strip, and

marginal strip portions at both sides of each flap between the end points of said penetrated line and the adjacent marginal edges of said strip and connecting all of said pieces of predetermined length in said strip,

whereby when said end of said strip roll protruding from said dispensing assembly is pulled, the strip moves to place the marginal strip portions which are closest said protruding strip end at the tear-off device for severing the end piece of said strip and leaving the next adjacent flap protruding from the assembly.

4,121,005

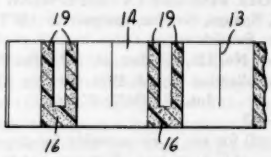
CONFORMABLE FOAM

Charles William Roberts, North Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 13, 1978, Ser. No. 877,310

Int. Cl.[2] B32B *3/10*

U.S. Cl. 428—131 **6 Claims**



1. A foam material which is conformable to body members and comprises a relatively thick foam sheet having a top surface and a skin contacting surface, said foam sheet containing therethrough a substantial number of perforations, said foam between a substantial number of the perforations being cut from the top surface through a portion of the thickness of the foam, said cuts resulting in foam segments which are hingedly connected to adjacent segments adjacent the skin contacting surface of said foam sheet, said foam containing a sufficient number of perforations to permit the foam to be relatively extensible in the longitudinal dimension and said foam having a stiffness in its latitudinal dimension of from about 0.4 gm/cm to about 2.0 gm/cm.

4,121,006

COATED POLYOLEFIN FILM

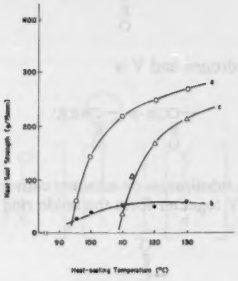
Yuichi Harada; Tetsuo Ishihara, and Shigeyuki Takahashi, all of Amagasaki, Japan, assignors to Daicel Ltd., Sakai, Japan

Filed Aug. 18, 1976, Ser. No. 715,380

Claims priority, application Japan, Aug. 25, 1975, 50/102796

Int. Cl.[2] B32B *3/00*

U.S. Cl. 428—172 **9 Claims**



1. A polyolefin film coated with

I. an undercoat consisting essentially of a mixture of

(a) polyvinylidene chloride or vinylidene chloride copolymer containing at least 88 weight percent of vinylidene chloride monomer units, and

(b) a chlorinated polypropylene having a chlorine content of from 15 to 55 percent by weight and an intrinsic viscosity of from 0.3 to 3.0 dl/g, wherein intrinsic viscosity is determined by measuring the viscosity of a solution of 0.2 to 0.5 percent by weight of said chlorinated polypropylene in decalin at 135° C., or a graft polymer of said chlorinated polypropylene having grafted thereto from 2 to 30 percent by weight, based on the weight of the graft polymer, of an ethylenically unsaturated vinyl monomer,

wherein the weight ratio of a/b is from 99/1 to 90/10, and

II. a top coat consisting essentially of a vinylidene chloride copolymer containing from 35 to 88 weight percent of vinylidene chloride monomer units.

4,121,007

PRINTED CIRCUIT BOARD MADE BY DISPERSION IMAGING

Hidehiko Kobayashi; Tatsumi Arakawa; Tetsuo Shiga; Kaoru Ohmura, and Sakae Ito, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 10, 1976, Ser. No. 713,317

Claims priority, application Japan, Aug. 19, 1975, 50-99785; Jun. 21, 1976, 51-72250

Int. Cl.[2] H01K *3/18*

U.S. Cl. 428—201 **13 Claims**

1. A printed circuit board comprising:

a base made of an insulating material;

a layer coated on the base and made of a polymer having a melting point or a softening point of 50 to 300° C. which polymer is selected from the group consisting of polyurethane, polyvinylidene chloride, polyvinyl acetate, polyvi-

nyl butyral, a copolymer of vinylidene chloride and vinyl acetate or acrylonitrile, a copolymer of vinyl chloride and vinyl acetate, a polycarbonate, a polyamide, a copolymer of styrene and acrylonitrile, a copolymer of acrylonitrile, butadiene and styrene, an epoxy resin, and blends thereof;

a layer covered on the layer of polymer and made of a dispersion imaging material containing elements selected from the group consisting of iron, cobalt, nickel, copper, silver, gold, bismuth, antimony, tin, aluminum, cadmium, zinc, lead, selenium, indium and tellurium;

said layer of dispersion imaging material having dispersed portions and undispersed portions; and

a pattern circuit of a conductive metal deposited only on said undispersed portions of the dispersion imaging material.

4,121,008

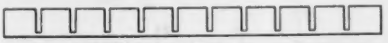
FOAM SANDWICH CONSTRUCTIONS

Robert Maxwell Seddon, Knaresborough, England, assignor to Unitex Limited, Knaresborough, England

Continuation-in-part of Ser. No. 547,939, Feb. 7, 1975, abandoned. This application Oct. 27, 1976, Ser. No. 735,959

Int. Cl.[2] B32B *7/00*

U.S. Cl. 428—251 **20 Claims**



1. A sandwich structure comprising two external skins each of a material having a relatively high modulus of elasticity and a relatively high tensile strength between which is sandwiched a core of a foam material having a relatively low density, a shear modulus of at least 3,400 kN/m^2 when measured at a strain of 10%, and a shear strength of not less than 620 kN/m^2, the said external skins being uniformly and firmly fixed to the core, the shear strength of the overall structure being mainly dependent on the properties of the core, and at least 50% of the resistance to deflection of the overall structure when under load being attributable to the core and said core providing the greater part of stress transmission between the external skins.

4,121,009

ANTI-STATIC FABRIC SOFTENING COMPOSITIONS AND PROCESSES FOR DRYING AND SOFTENING TEXTILES THEREWITH

Paritosh Mohan Chakrabarti, Wayne, N.J., assignor to GAF Corporation, New York, N.Y.

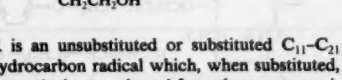
Continuation-in-part of Ser. No. 502,638, Sep. 3, 1974, abandoned. This application Sep. 14, 1976, Ser. No. 723,199

Int. Cl.[2] D06M *13/34*

U.S. Cl. 428—260 **30 Claims**

1. A fabric softening composition comprising

(a) a fabric softener having the formula:



wherein R is an unsubstituted or substituted C_{11}–C_{21} aliphatic hydrocarbon radical which, when substituted, has at least one substituent selected from the group consisting of Cl, Br, OH, and OCH_3 and (b) an adsorbent substrate having from about 10% to about 90% free space based on the overall volume of the substrate, the fabric softener being incorporated into said substrate.

22. A process of simultaneously drying and softening textile materials in a dryer, comprising the step of contacting said textile materials, under normal drying conditions, with an effective amount of a fabric softening composition as defined in claim 1.

4,121,010

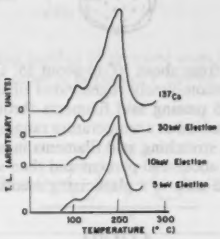
THERMOLUMINESCENT PHOSPHOR

Jerome B. Lasky, and Paul R. Moran, both of Madison, Wis., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 27, 1977, Ser. No. 819,429

Int. Cl.[2] B32B *5/16;* **C09K** *11/08*

U.S. Cl. 428—403 **7 Claims**



1. A thermoluminescent phosphor comprising a major portion by weight of LiF and a minor proportion by weight of the dopants boron and magnesium.

4,121,011

POLYMERIC ARTICLE COATED WITH A THERMOCHROMIC PAINT

Leon C. Glover, Los Altos, and Eugene F. Lopez, Sunnyvale, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 635,951, Nov. 28, 1975, which is a continuation-in-part of Ser. No. 460,124, Apr. 11, 1974, abandoned. This application Jun. 9, 1977, Ser. No. 805,007

Int. Cl.[2] C09J *7/02;* **C09D** *5/26;* **B65D** *65/14, 83/00*

U.S. Cl. 428—347 **6 Claims**

1. In an article comprising a polymeric material subject to oxidative degradation and having a thermochromic paint thereon, said paint containing a thermochromic pigment comprising a metallic compound, the improvement comprising the addition to the paint of a non-thermochromic compound in amounts effective to inhibit degradation of said polymeric material by the thermochromic pigment, said non-thermochromic compound selected from the group consisting of the sulfates, hydrated sulfates and nitrides of boron, aluminum, tin, lead, arsenic, antimony, bismuth, zinc and phosphorus; the sulfides and hydrated sulfides of boron, aluminum, bismuth and phosphorus; the oxides and hydrated oxides of boron, arsenic, and antimony and the salts, organic compounds and free acids of the oxyanions of boron, arsenic, and antimony and oxides, salts and organic derivatives of oxyanions of phosphorus.

4,121,012

CRIMPED, HIGH-STRENGTH RAYON YARN AND METHOD FOR ITS PREPARATION

Gregory C. Bockno, Media, Pa., assignor to Avtex Fibers Inc., Valley Forge, Pa.

Continuation-in-part of Ser. No. 376,430, Jul. 5, 1973, abandoned, which is a continuation of Ser. No. 84,202, Oct. 26, 1970, abandoned, which is a continuation-in-part of Ser. No. 709,375, Feb. 29, 1968, abandoned. This application Feb. 6, 1976, Ser. No. 655,811

Int. Cl.[2] D01F *2/06;* **D01D** *5/22*

U.S. Cl. 428—369 **15 Claims**

1. A method for preparing crimped high-strength rayon which consists essentially of extruding a multiplicity of filaments of viscose prepared with from about 6 to about 9 percent cellulose, from about 6 to about 9 percent caustic soda, and from about 28 to about 39 percent carbon disulfide, based on the weight of the cellulose, said viscose containing from about 1 to about 8 percent based on the weight of the cellulose of a

regeneration retardant, and having a spinning ball-fall viscosity of from about 40 to about 150 and a common salt index of from about 6 to about 11, into a spinning bath containing from about 4 to about 7 percent sulfuric acid, from about 2 to about 5 percent zinc sulfate and from about 15 to about 24 percent sodium sulfate, said spinning bath being maintained at a temperature ranging from about 30° to about 55° C., withdrawing coagulated and incompletely regenerated filaments from said spinning bath and passing said filaments through an aqueous stretch bath maintained at a temperature ranging from about 75 to about 100° C., stretching said filaments in said stretch bath from about 90 to about 140 percent and then sluicing the filaments in a relaxed state in a plasticizing medium.

4,121,013
RECORD MATERIAL

Robert E. Miller, and Bruce W. Brockett, both of Appleton, Wis., assignors to NCR Corporation, Dayton, Ohio

Division of Ser. No. 570,051, Apr. 28, 1975, Pat. No. 4,022,936. This application Apr. 21, 1977, Ser. No. 789,384
Int. Cl.[2] B41L *1/20*; E05A *3/48*
U.S. Cl. 428—411 11 Claims

1. A sensitized record sheet material comprising a substrate and a coating comprising an active material consisting essentially of the dried residue of an aqueous dispersion of a 3,5-substituted salicylic acid, a zinc compound selected from the group consisting of zinc oxide, zinc carbonate, zinc phosphate and zinc phenol sulfonate, and ammonium hydroxide at a pH of 7.5 to 10.0, wherein the 3,5'substituted salicylic acid is present in an amount of 0.1 to 0.4 grams per square meter and the 3,5-substituted salicylic acid and the zinc compound are present in a weight ratio of 1:1 to 1:6.

5. A process for making a paper coating composition comprising the steps of:

(a) dispersing into an aqueous liquid vehicle active material consisting essentially of a 3,5-substituted salicylic acid and a zinc compound, selected from the group consisting of zinc oxide, zinc carbonate, zinc phosphate, zinc phenol sulfonate, wherein the 3,5-substituted salicyclic acid and the zinc compound are present in a weight ratio of about 1:1 to 1:6; and

(b) adjusting the pH of the dispersion to 7.5 to 10.0 by addition of ammonium hydroxide.

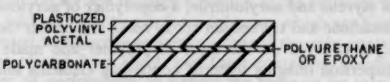
9. A paper coating composition comprising an aqueous liquid vehicle and active material consisting essentially of a 3,5-substituted salicylic acid; a zinc compound selected from the group consisting of zinc oxide, zinc carbonate, zinc phosphate and zinc phenol sulfonate; and ammonium hydroxide in an amount to maintain the pH of the composition at 7.5 to 10.0, wherein the 3,5' substituted salicylic acid and the zinc compound are present in a weight ratio of about 1:1 to 1:6.

4,121,014
HAZE-FREE TRANSPARENT LAMINATE HAVING A PLASTICIZED POLYVINYL ACETAL SHEET

Paul E. Shaffer, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 340,512, Mar. 12, 1973, abandoned. This application Jul. 25, 1977, Ser. No. 818,913
Int. Cl.[2] B32B *27/36*
U.S. Cl. 428—412 7 Claims

1. A substantially haze-free transparent laminate comprising a sheet of polycarbonate, a sheet of polyvinyl acetal plasticized with a plasticizer that produces haze in said polycarbonate when said plasticized polyvinyl acetal contacts said polycarbonate and a layer of polyurethane or an epoxy resin interposed between the interfacial surfaces of said sheet of polycarbonate and said sheet of polyvinyl acetal so plasticized for protecting said polycarbonate sheet from haze produced by

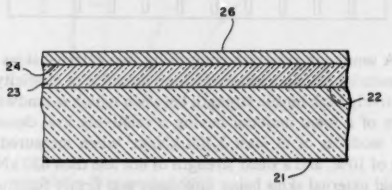


contact with said plasticized sheet and for bonding said sheets together.

4,121,015
CURED EPOXY POLYMER HAVING IMPROVED ADHESIVE PROPERTIES

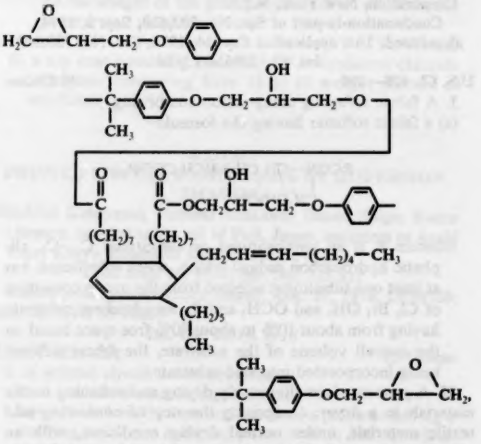
Charles Allen McPherson, Eastampton Township, Burlington County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Continuation of Ser. No. 465,376, May 1, 1974, abandoned, which is a continuation-in-part of Ser. No. 443,648, Feb. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 369,038, Jun. 11, 1973, abandoned. This application Nov. 1, 1976, Ser. No. 737,638
Int. Cl.[2] B32B *15/08, 27/38*
U.S. Cl. 428—418 14 Claims



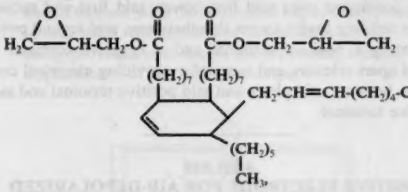
1. An article which comprises:

a first layer comprising a fully cured virgin epoxy polymer resulting from fully curing a mixture of (1) a resin component comprising, (a) about 25 to about 95 parts by weight per 100 parts by weight of said resin component of a diglycidyl ether based upon linoleic dimer acid selected from the group consisting of (a^1) an adduct of two moles of the diglycidyl ether of bisphenol A and one mole of linoleic dimer acid having a structural formula of

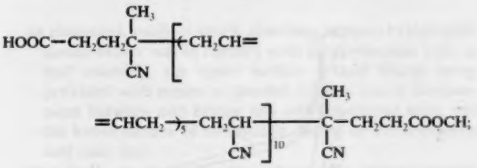


and an epoxide equivalent weight of 650 to 750, (b^1) a diglyc-

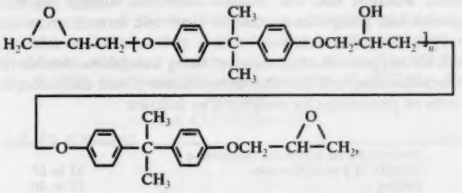
idyl ether of linoleic dimer acid having a structural formula of



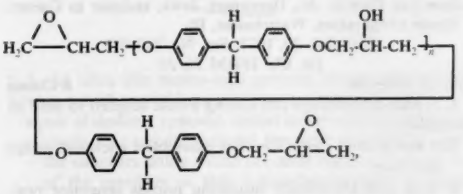
and an epoxide equivalent weight of 400 to 420, and (c[1]) a mixture thereof; (b) about 5 to about 50 parts by weight per 100 parts by weight of the resin component of an elastomerically modified epoxy resin blend comprising the reaction product of about 40 weight percent of a carboxyl terminated acrylonitrile/butadiene random copolymer having a structural formula of



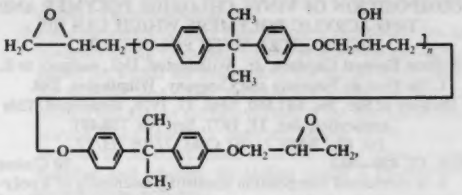
containing 2.37 percent carboxyl groups, 18 to 19 percent bound acrylonitrile and having a number average molecular weight of 3200, combined with about 60 weight percent of a diglycidyl ether selected from the group consisting of a diglycidyl ether of bisphenol A having a general structural formula of



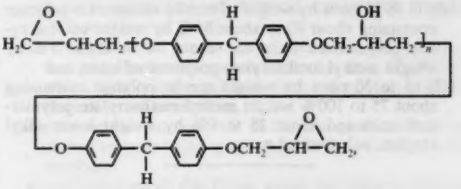
where *n* is the number of repeated units in the resin chain, having an epoxide equivalent weight of 180 to 195 and a diglycidyl ether of bisphenol F having a general structural formula of



where *n* is the number of repeated units in the resin chain having an epoxide equivalent weight of 152 to 167, and (c) a remainder of the resin component of a suitable diglycidyl ether selected from the group consisting of a diglycidyl ether of bisphenol A, having a general structural formula of

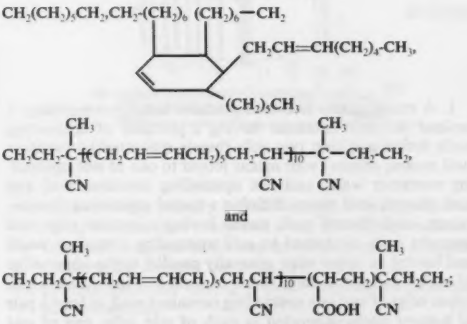


where *n* is the number of repeated units in the resin chain, a diglycidyl ether of bisphenol F having a general structural formula of



where *n* is the number of repeated units in the resin chain and a mixture thereof; and (2) a suitable curing agent selected from the group consisting of (a) an acid anhydride present in an amount ranging from about 16 to about 60 parts by weight per 100 parts by weight of the resin component, (b) a suitable polyamine present in an equal mole-to-mole ratio with the resin component, (c) a mixture comprising said polyamine in (b) above combined with at least 5 parts by weight per 100 parts by weight of the resin component of a suitable acid anhydride, (d) a mixture comprising said acid anhydride in (a) above combined with up to about 30 parts by weight per 100 parts by weight of the resin component of a carboxylic acid selected from the group consisting of a dicarboxylic acid having a structural formula of

where R″ is an organic radical selected from the group consisting of



and

and a trimer acid having a stoichiometry of $C_{54}H_{96}O_6$, and a mixture thereof, and (e) mixture of the foregoing; and an adherent metal layer deposited on at least a portion of said first fully cured virgin epoxy layer.

4,121,016

COMPOSITION OF VINYL CHLORIDE POLYMER AND TWO ACRYLIC POLYMERS WHICH CAN BE REINFORCED WITH POLYESTER

William Emmett Garrison, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 667,660, Mar. 17, 1976, abandoned. This application Jan. 11, 1977, Ser. No. 758,491

Int. Cl.[2] B32B *27/30;* C08L *27/06, 33/12*

U.S. Cl. 428—483 10 Claims

1. A reinforced composition consisting essentially of a polyester directly bonded to a composition consisting essentially of

(A) 60 to 80 parts by weight of vinyl chloride polymer comtaining at least about 85% by weight vinyl chloride polymerized units, in which any copolymer units are polymerized units of a lower α-olefin of 2 to 4 carbon atoms;

(B) 11 to 23 parts by weight of acrylic elastomeric polymer containing about 30 to about 95% by weight butyl acrylate polymerized units and about 70 to about 5% by weight methyl methacrylate polymerized units; and

(C) 15 to 30 parts by weight acrylic polymer containing about 75 to 100% weight methyl methacrylate polymerized units and about 25 to 0% by weight lower alkyl acrylate polymerized units.

4,121,017

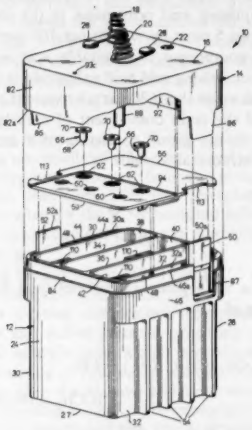
PORTABLE RECHARGEABLE LEAD-ACID BATTERY

Thomas John Dougherty, Waukesha, and Roy Erving Hennen, Mequon, both of Wis., assignors to Globe-Union Inc., Milwaukee, Wis.

Filed Oct. 25, 1977, Ser. No. 845,280

Int. Cl.[2] H01M *2/30*

U.S. Cl. 429—7 17 Claims



1. A rechargeable lead-acid portable battery comprising: a molded polymer container having a plurality of upstanding walls defining at least two cells therein separated by partition wall means; channel wall means joined to one of said upstanding container walls, said one upstanding container wall and said channel wall means defining a spatial separation therebetween, said channel wall means having a bottom edge and opposite ends connected to said upstanding container wqall and having an upper edge generally parallel to the upper edge of one of said upstanding container walls and spaced from said upper edge of said one upstanding container wall; at least a pair of battery plates supported in each of said cells, one of said plates of each of said pairs being a negative plate and the other of said plates being a positive plate; an aperture in said partition wall means; means for providing electrical connection between a positive plate of one of said cells and a negative plate of the other of said cells, said connection means including an electrically conductive connection extending through said aperture; a first cover covering said cells in sealed relation and preventing electrolyte from escaping from said cells; a second battery cover positioned over said first cover, said first and second covers defining cavity means therebetween, said second cover supporting a positive terminal and a negative terminal in spaced apart relation, and means for providing electrical connection between said plates and said positive terminal and said negative terminal.

4,121,018

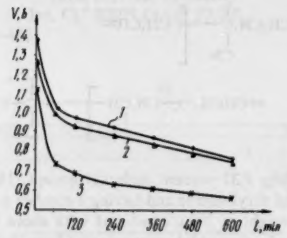
POSITIVE ELECTRODE FOR AIR-DEPOLARIZED ALKALINE PRIMARY CELL WITH THICKENED ELECTROLYTE

Meer Danilovich Kocherginsky, ulitsa Komarova, 6, kv. 23; Lidia Fedorovna Penkova, ulitsa 3 Mytischinskaya, 14a, kv. 124, and Viktor Arsenievich Naumenko, ulitsa Novo-Alexeevskaya, 48, korpus 37, kv. 28, all of Moscow, U.S.S.R.

Filed Aug. 9, 1976, Ser. No. 712,505

Int. Cl.[2] H01M *12/06*

U.S. Cl. 429—27 3 Claims



1. In an air-depolarized alkaline primary cell comprising a positive electrode and a thickened electrolyte; the improvement, whereby said cell exhibits improved storage life and service life, comprises a positive electrode formed of an air oxygen reduction catalyst, carbon, and an alkaline solution; said air oxygen reduction catalyst being manganese dioxide of γ-modification, and the mass composition of said electrode, in terms of percentage by weight, is as follows:

electrolytic or synthetic manganese dioxide of γ-modification	33 to 67
carbon	12 to 40
potassium hydroxide solution	20 to 28

4,121,019

LEAD-ACID STORAGE BATTERY

Nelson Lee Garrett, Jr., Davenport, Iowa, assignor to Garrett Plante Corporation, Westchester, Ill.

Filed Jul. 20, 1977, Ser. No. 817,492

Int. Cl.[2] H01M *10/16*

U.S. Cl. 429—94 8 Claims

1. A lead-acid storage cell having a case adapted to hold an electrolyte;

first and second electrode plate assemblies enclosed within said case;

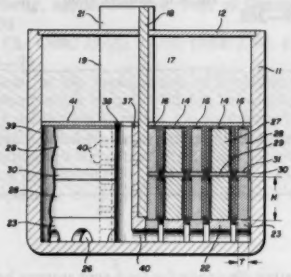
at least one electrically insulating porous separator positioned between said first and second assemblies for preventing direct electrical contact therebetween while permitting said electrolyte free access to both of said assemblies;

each of said assemblies comprising:

a plurality of elongated strips of lead each having a generally vertical face, said strips being vertically arranged in a

stack, each of said strips having a ratio of height-to-thickness within the range of 0.5–10;

an elongated, resilient shock-absorbing retainer separating and in contact with the horizontal edges of adjacent strips in said stack, the upper and lower faces of said retainer being provided with means for preventing relative lateral displacement of said adjacent strips;



an elongated, resilient shock-absorbing support bridge positioned below and in contact with the lowermost strip in said assembly, the upper surface of said bridge being provided with means to prevent relative lateral displacement between said bridge and said lowermost strip, and the lower surface of said bridge resting on the bottom of said case; and

electrically conductive means electrically interconnecting the strips in said assembly.

4,121,020

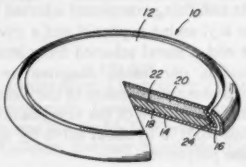
ULTRA-THIN BUTTON-TYPE PRIMARY ELECTROCHEMICAL CELL

James Epstein, Sharon, and William P. Brissette, Halifax, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Continuation of Ser. No. 761,353, Jan. 21, 1977, abandoned, which is a continuation of Ser. No. 612,056, Sep. 10, 1975, abandoned, which is a continuation-in-part of Ser. No. 539,751, Jan. 9, 1975, abandoned. This application Sep. 19, 1977, Ser. No. 834,745

Int. Cl.[2] H01M *6/12*

U.S. Cl. 429—162 **1 Claim**



1. An ultra-thin button-type primary electrochemical cell having a thickness of less than 5mm and comprising:

a pair of shallow, opposed, dished cover members formed of conductive metallic material, the outer rim of a first one of the members fitting within the outer rim of the second one of the members so that a disc-shaped space is formed therebetween;

an electrically insulating sealing gasket positioned between the outer rims of the cover members to electrically isolate the cover members from each other so that the respective cover members may act as the terminals of the primary electrochemical cell,

the outer rim of the first one of the cover members being compressed against the sealing gasket thereby forcing the sealing gasket against the second cover member to seal the primary electrochemical cell;

the sealing gasket being a ring having a rim which has an inwardly facing L-shaped cross-section so that the sealing gasket fits within the outer rim of the second cover member and the first cover member fits within the upright portion and against the base portion of the rim, the upright portion being inwardly distorted against the first cover member by the compressed outer rim of the second cover member, and wherein the sealing gasket is formed of a fluorocarbon polymer;

a thin, porous carbon cathode disc including a mechanical binder for forming a binding network of chain-like connections between the cathodic particles, the cathode thereby having a flexible structure adapted to conform to the cell wall geometry, the cathode fitting within and being in mechanical and electrical contact with the inner surface of one of the cover members,

the thin preformed porous carbon cathode having a conductive metallic screen current collector at a side thereof which is in mechanical and electrical contact with the respective cover member,

the screen current collector of the thin preformed porous carbon cathode being spot-welded to the respective cover member;

a thin lithium anode disc fitting within and being in mechanical and electrical contact with the inner surface of the other of the cover members, said lithium anode disc being pressed into the first cover member to form electrical contact therewith;

a thin porous separator being interposed between and in contact with the anode and the cathode; and

an effective quantity of an electrolytic solution comprising a solute dissolved in an inorganic oxyhalide or thiohalide solvent diffused through the cathode disc and the separator,

wherein the solvent is selected from the group consisting of phosphorus oxychloride, thionyl chloride, sulfuryl chloride, and mixtures thereof; and

wherein the solvent functions as the cathode depolarizer and is electrochemically reduced on the carbon cathode during discharge of the cell.

4,121,021

SILVER OXIDE PRIMARY CELL

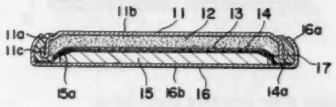
Hiromichi Ogawa, Katano; Kenji Inoue, Hirakata, and Akira Fujiwara, Shijonawate, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 7, 1977, Ser. No. 813,775

Claims priority, application Japan, Jul. 7, 1976, 51-81239

Int. Cl.[2] H01M *6/12*

U.S. Cl. 429—162 **10 Claims**



1. A silver oxide primary cell of flat type which comprises:

a casing composed of a cup and a cap electrically insulated from and received in the cup to define a sealed chamber between the cup and the cap;

a positive electrode having a silver oxide as its principal active material;

a separator;

an electrolyte absorbent layer impregnated with an electrolyte;

a negative electrode having zinc as its principal active material;

said positive electrode, separator, electrolyte absorbent

layer and negative electrode being stacked one above the other in the order given above, the stack being housed within the casing in a manner such that said positive and negative electrodes are held in contact with the cup and the cap, respectively; and

at least one of the opposed peripheral edges on the respective surfaces of the positive electrode being chamfered to provide a chamfered edge, the entire area of said chamfered edge being in intimate contact with the separator.

4,121,022
POLY (2-HYDROXYETHYLMETHACRYLATE) MEMBRANES FOR ELECTROCHEMICAL USE

Richard Dick, Paris; Georges Feuillade, Arpajon; Robert Gadessaud, Massy Palaiseau, and Louis Nicolas, Neuilly sur Seine, all of France, assignors to Compagnie Generale d'Electricite, Paris Cedex and Institut National de Recherche Chimique Appliquee Ircha, Paris, both of France

Filed Dec. 13, 1977, Ser. No. 860,410

Claims priority, application France, Dec. 13, 1976, 76 37503

Int. Cl.[2] H01M *6/04*

U.S. Cl. 429—204 **8 Claims**

1. A semi-permeable membrane with a microporous structure comprising a first polymer and a second polymer intimately mixed together, the first polymer being reticulated poly (2-hydroxyethylmethacrylate), wherein the second polymer comprises one polymer or a mixture of several different polymers chosen from among the following substances: polyoxyethylene glycol, polyvinylpyrrolidone, polyacrylic acid, polymethacrylic acid, copolymers of acrylic or methacrylic acid, polyacrylates and polymethacrylates of alkyls, and copolymers of acrylates and methacrylates of alkyls.

8. A lead-acid storage cell comprising a positive electrode, a negative electrode, a separator and a sulphuric acid electrolyte, characterized by the fact that the separator is at least partially constituted by a membrane according to claim 1.

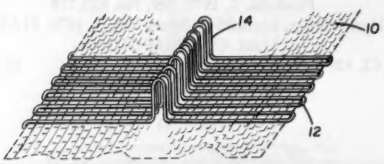
4,121,023
BATTERY PLATE AND METHODS OF MANUFACTURE

David B. Parkinson, Cleveland Heights, and Truman D. Parkinson, Chardon, both of Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Filed Oct. 7, 1977, Ser. No. 840,372

Int. Cl.[2] H01M *4/14, 4/74*

U.S. Cl. 429—211 **4 Claims**



1. Battery plate structure comprising:

a web of textile material having spaced conductive material wires included as at least a portion of the discrete weft elements of said web, said wires extending at least part way across said web and being gathered to form at least two spaced terminals;

electrochemically active material applied to said web at laterally spaced locations thereon adjacent said spaced terminals, said material penetrating said web to intimately contact said wires; and

means cooperating with said web between said laterally spaced locations for supporting said plate structure by said web, without significantly mechanically stressing said wires.

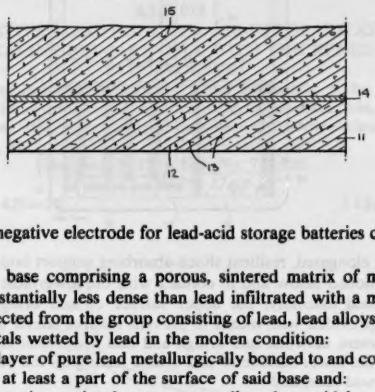
4,121,024
NEGATIVE ELECTRODE FOR LEAD-ACID STORAGE BATTERY

Pierre Paul Turillon, Ramsey, N.J.; Michael Neill Hull, and George Frederick Nordblom, both of Yardley, Pa., assignors to The International Nickel Company, Inc., New York, N.Y. and ESB Corporation, Philadelphia, Pa.

Filed Nov. 10, 1977, Ser. No. 850,271

Int. Cl.[2] H01M *4/66*

U.S. Cl. 429—245 **5 Claims**



1. A negative electrode for lead-acid storage batteries comprising

(A) a base comprising a porous, sintered matrix of metal substantially less dense than lead infiltrated with a metal selected from the group consisting of lead, lead alloys and metals wetted by lead in the molten condition:

(B) a layer of pure lead metallurgically bonded to and covering at least a part of the surface of said base and:

(C) negative active battery mass adhered to said layer of pure lead.

4,121,025
POLYMER COMPOSITIONS

Gerald Scott, c/o The University of Aston in Birmingham, Gosta Green, Birmingham 4, England

Filed Jul. 20, 1971, Ser. No. 164,462

Claims priority, application United Kingdom, Jul. 22, 1970, 35546/70; May 3, 1971, 12826/71

Int. Cl.[2] C08J *3/20*

U.S. Cl. 526—4 **14 Claims**

1. In a plastics composition which comprises a thermoplastic homopolymer or copolymer of a vinyl monomer or mixture thereof the improvement wherein it also contains at least one non-ionic organo-soluble antioxidant complex of a chain-breaking, peroxide-decomposing, metal ion deactivating or ultra-violet light stabilising compound selected from the group consisting of an aryl-amine, a phenol and a trivalent phosphorus antioxidant and a metal selected from iron, silver, palladium, molybdenum, chromium, tungsten or cerium in an amount such as to cause degradation of the pastics composition at the end of the desired life of the composition, said amount being from about 0.001% to about 0.1% by weight based on the weight of the polymer.

4,121,026
COPOLYMERS OF ALPHA-OLEFINS AND MALEIC ANHYDRIDE REACTED WITH AMINES IN THE PRESENCE OF LEWIS ACIDS

William J. Cheng, and David B. Guthrie, both of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Mar. 23, 1973, Ser. No. 344,420

Int. Cl.[2] C08F *8/32, 8/44, 22/06*

U.S. Cl. 526—15 **10 Claims**

1. A process of reacting a copolymer of an alpha-olefin and maleic anhydride with a primary amine, a secondary amine or mixtures thereof in the presence of a Lewis acid, the molar ratio of amine to maleic anhydride in the copolymer being from about 0.25 to about 3.

6. The product of claim 1.

4,121,027

POLYMERIZATION INITIATORS CONTAINING THIO BRIDGES

Heinz Pohlemann, Limburgerhof; Herbert Naarmann, Wattenheim, and Dieter Seebach, Lich, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhine, Fed. Rep. of Germany

Filed May 2, 1977, Ser. No. 792,881

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1976, 2624631

Int. Cl.[2] C08C *19/20, 19/00;* **C08F** *2/00, 4/16*

U.S. Cl. 526—29 **10 Claims**

1. A process for the manufacture of a polymer of one or more vinyl compounds by polymerizing the monomeric vinyl compound(s), employing as initiator in an amount of from 0.05 to 5% by weight based on the monomer(s) a compound which forms free radicals, wherein said compound which forms free radicals that is used during the polymerization is selected from organic compounds, containing thio bridges, of the general formula (I)

(I)

where R^1, R^2 and R^3 may be identical or different and each is —S—alkyl, —S—cycloalkyl or —S—aryl, each substituent R^1, R^2 and R^3 being of up to 14 carbon atoms, and any 2 of the substituents being optionally linked to form a ring, and R^4 is —S—alkyl, —S—cycloalkyl or —S—aryl, each of up to 14 carbon atoms, or is

but, where R^4 is

R^3 may also be hydrogen or an —Si—(—X)$_3$ group, X being linear alkyl of 1 to 3 carbon atoms.

4,121,028

PRESSURE SENSITIVE ADHESIVE COMPOSITION

Richard G. Marchessault, Louisville; Thomas P. Carter, Jr., Jeffersontown, and Martin M. Williams, Louisville, all of Ky., assignors to Celanese Polymer Specialties Company, Louisville, Ky.

Filed Jul. 5, 1977, Ser. No. 812,880

Int. Cl.[2] C08F *8/32, 8/42*

U.S. Cl. 526—48.1 **7 Claims**

1. In a pressure-sensitive adhesive composition which when dry forms a tacky adhesive of high cohesive strength, said composition being formed from an organic solvent solution of

(A) an acrylic interpolymer made from

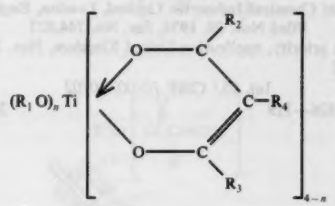
(1) about 0.5 to about 20 weight percent of a polymerizable monoethylenically unsaturated carboxylic acid,

(2) at least one monomer selected from the group consisting of alkyl esters of acrylic acid or methacrylic acid wherein the alkyl group contains 4 to 18 carbon atoms or dialkyl esters of maleic or fumaric acid wherein each alkyl group contains 4 to 18 carbon atoms and

(3) optionally, another monomer copolymerizable therewith,

wherein the interpolymer has a weight average molecular weight in the range of 10,000 to 500,000 and a glass transition temperature in the range of 0° C. to −75° C., and

(B) a chelate ester of orthotitanic acid having the formula



wherein n is an integer of 2 or 3, R_1 is C_2 to C_{10} alkyl, alkenyl, substituted alkyl or substituted alkenyl group, R_2 is C_1 to C_6 alkyl, alkoxy, alkenyl, or alkenoxy group, R_3 is a C_1 to C_6 alkyl or alkenyl group or a C_6 to C_{10} aryl group, and R_4 is hydrogen or a C_1 to C_6 alkyl or alkenyl group, and R_2 and R_3 may be combined as an ethylene or trimethylene group;

the improvement which comprises the addition to said adhesive composition of a tertiary amine in the amount of about 0.01 to about 1.5 equivalents of amine per each carboxylic acid equivalent in the interpolymer.

4,121,029

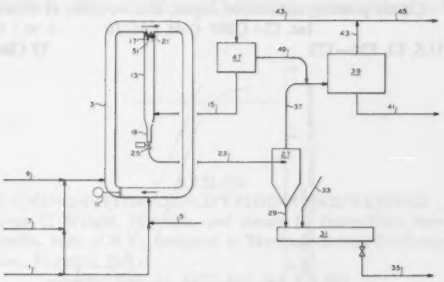
POLYOLEFIN REACTOR SYSTEM

Howard B. Irvin, and Fred T. Sherk, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 6, 1976, Ser. No. 748,086

Int. Cl.[2] C08F *10/06*

U.S. Cl. 526—64 **8 Claims**



1. In a pipe-loop reactor system, apparatus comprising

(1) a wash column attached to the upper run of the reactor with means at the juncture of the wash column and of the pipe-loop reactor for restricting flow from the loop into the wash column,

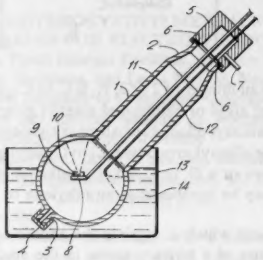
(2) an appended settling leg attached to the wash column, said wash column provided with means for admitting purified monomer wash liquid into the base of the column above the settling leg, and

(3) means for removing polymer slurry from said settling leg.

4,121,030
TRANSITION METAL COMPOSITION

John Paton Candlin, Aston; Keith Collier Wilson, St. Albans, and Ronald Pearce, Runcorn, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 24, 1976, Ser. No. 744,827
Claims priority, application United Kingdom, Nov. 25, 1975, 48406/75
Int. Cl.[2] C08F *10/00, 10/02*
U.S. Cl. 526—119 21 Claims

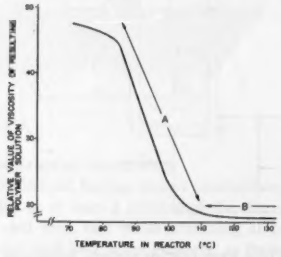


1. A process for the treatment of compounds of transition metals wherein a compound of a transition metal of Group IVA of the Periodic Table, which compound contains at least one π-bonded arene group, is contacted with a particulate inorganic compound which is (A) an inorganic oxide, an inorganic hydroxide, an inorganic oxyhalide, an inorganic hydroxyhalide or an inorganic halide; (B) a mixture of at least two compounds from (A); or (C) a compound obtained by the reaction of at least two compounds from (A).

4,121,031
PROCESS FOR PRODUCING RANDOM COPOLYMERS

Saburo Minekawa; Sigeru Yonekawa; Haruro Tabata, all of Yokohama-shi, Kanagawa-ken; Takashi Ishida, Kamakura-shi, Kanagawa-ken; Satoshi Tsuchida, Yokohama-shi, Kanagawa-ken, and Kiyoshi Yamada, Kawasaki-shi, Kanagawa-ken, all of Japan

Continuation of Ser. No. 200,558, Nov. 19, 1971, abandoned, which is a continuation-in-part of Ser. No. 686,226, Nov. 28, 1967, abandoned. This application Jun. 24, 1976, Ser. No. 699,313
Claims priority, application Japan, Dec. 9, 1966, 41-80365
Int. Cl.[2] C08F *4/48, 236/10*
U.S. Cl. 526—173 12 Claims



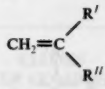
9. In the process for producing a substantially random copolymer by contacting 1,3-butadiene and styrene in the presence of a catalyst consisting of [metallic lithium or] an alkyllithium in a hydrocarbon solvent to form said copolymer, the improvement which comprises charging simultaneously to a reactor a reactor charge consisting of said butadiene, styrene and n-butyllithium catalyst, and n-hexane solvent, or charging simultaneously said butadiene, styrene and n-hexane solvent to n-butyllithium catalyst in a reactor, the concentration of styrene and butadiene being from about 25 to about 33 percent by weight, the styrene/butadiene ratio being from 1/10 to 4/10, and in the process maintaining the resulting reaction mixture at a temperature not higher than 150° C. and above about 100° C. when the [sytrene] styrene/butadiene ratio is 4/10 and above about 110° C. when the styrene/butadiene ratio is 1/10, at which temperature the viscous solution of the resulting copolymer separates from said reaction mixture to form a slurry.

4,121,032
PROCESS FOR PREPARING ALTERNATING COPOLYMER OF CONJUGATED VINYL COMPOUND AND OLEFINIC UNSATURATED COMPOUND WITH OXYGEN AND BORON COMPOUND

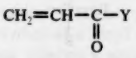
Kohei Nakaguchi, Osaka; Shohachi Kawasumi, Kobe; Masaaki Hirooka, Ibaraki; Hiroshi Yabuuchi, Takatsuki, and Hiroyoshi Takao, Ashiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 320,909, Jan. 4, 1973, Pat. No. 3,894,997, which is a continuation-in-part of Ser. No. 3,559, Jan. 9, 1970, abandoned, which is a continuation of Ser. No. 560,857, Jun. 27, 1966, abandoned. This application Apr. 15, 1975, Ser. No. 568,319
Claims priority, application Japan, Jun. 30, 1965, 40/39488; Jul. 10, 1965, 40/41590
Int. Cl.[2] C08F *4/52, 20/18*
U.S. Cl. 526—197 4 Claims

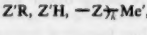
1. In a process for preparing an alternating copolymer by copolymerizing an olefinic unsaturated compound having the formula



wherein R^I and R^{II} are independently hydrogen, a halogen atom, a hydrocarbon radical having 1 to 20 carbon atoms, or a halogen-containing hydrocarbon radical having 1 to 20 carbon atoms, and a conjugated vinyl compound selected from the group consisting of acrylonitrile and compounds having the formula,



wherein Y is a member selected from the group consisting of



NR'R'' and R groups, and halogen and hydrogen atoms; Z' is an oxygen or sulfur atom; R is a hydrocarbon or halohydrocarbon radical having 1 to 20 carbon atoms; R' and R'' are the same or different groups selected from the group consisting of hydrogen atom and a hydrocarbon or halohydrocarbon radicals having 1 to 20 carbon atoms, and may be bonded to each other to form a morpholino, a pyrrolidino or a piperidino group; and Me' is an element from Groups I to II of the Mendeleev Periodic Table, where *k* is equal to the valency of Me', or an ammonium group, with a catalyst at a temperature of −150° to +100° C, the improvement which comprises effecting the copolymerization at a pressure up to 100 kg/cm^2 by contacting the monomers in the presence of oxygen present in an amount up to 100 mole percent based on said catalyst with said catalyst selected from the group consisting of (1) at least one organo-boron halide having the formula,

wherein R''' is a hydrocarbon radical having 1 to 20 carbon atoms, X is a halogen atom, and *n* is 1 or 2, (2) a combination of at least two members selected from the groups having the following formulas,

$$BR'''_nX_{3-n} \quad (a)$$

wherein R''', X and n are as defined above,

$$BR_3^{IV} \quad (b)$$

wherein R^{IV} is a hydrocarbon radical having 1 to 20 carbon atoms, and

$$BX'_3 \quad (c)$$

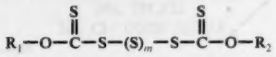
wherein X' is a halogen atom, said catalyst being used in an amount of from 0.0005 to 10 moles per mole of said conjugated vinyl compound.

4,121,033
CHLOROPRENE-SULFUR POLYMERIZATION WITH DI(O-ALKYLTHIONOTHIOLCARBONOXY)SULFIDES

Morris S. Edmondson, Alvin, Tex., assignor to Denka Chemical Corporation, Houston, Tex.

Filed Nov. 8, 1976, Ser. No. 739,635
The portion of the term of this patent subsequent to Dec. 2, 1992, has been disclaimed.
Int. Cl.[2] **C08F** *2/26, 2/24, 36/18*
U.S. Cl. 526—223 **5 Claims**

1. A process for the emulsion polymerization of chloroprene and sulfur for the preparation of chloroprene-sulfur copolymers having improved viscosity stability which comprises polymerizing chloroprene and 0.2 to 0.6 parts by weight of elemental sulfur per 100 parts of polymerizable monomer in the presence of 0.05 to 5.0 parts by weight per 100 parts of monomer of a modifier having the formula



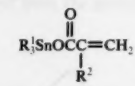
wherein R_1 is a hydrocarbon radical having from 1 to 8 carbon atoms, R_2 is a hydrocarbon radical having from 1 to 8 carbon atoms and m is 1 to 4.

4,121,034
BIOLOGICALLY ACTIVE TRIORGANOTIN COPOLYMERS

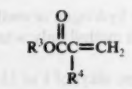
John R. Bednarski, Flushing, N.Y., and David B. Russell, Westfield, N.J., assignors to M&T Chemicals Inc., Stamford, Conn.

Division of Ser. No. 738,001, Nov. 2, 1976. This application Jun. 13, 1977, Ser. No. 805,838
Int. Cl.[2] **C08F** *30/04, 130/04, 230/04, 4/32*
U.S. Cl. 526—240 **14 Claims**

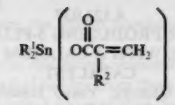
1. A biologically active copolymer obtained by reacting in the presence of a free radical polymerization initiator and a liquid hydrocarbon medium at least one solubilized triorganotin compound of the general formula



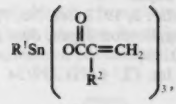
with at least one solubilized copolymerizable monomer of the general formula



and from 0.01 to 10%, based on total monomer weight, of a crosslinking agent selected from the group consisting of divinyl benzene, compounds of the formulae



and



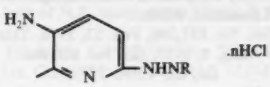
esters of acrylic or metharylic acid with polyfunctional alcohols and phenols, wherein said esters contain from 2 to 4 residues of said acid, and wherein each R^1 is individually selected from the group consisting of alkyl radicals containing from 1 to 8 carbon atoms, cycloalkyl and aryl radicals, R^2 and R^4 are individually selected from hydrogen and methyl radicals and R^3 represents an alkyl radical containing from 1 to 18 carbon atoms, a cyclohexyl or a phenyl radical.

4,121,035
5-AMINO-2-HYDRAZINOPYRIDINE AND DERIVATIVES THEREOF

George C. Wright, Norwich, and James L. Butterfield, New Berlin, both of N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Feb. 22, 1977, Ser. No. 770,507
Int. Cl.[2] **C07D** *213/77;* **A61K** *31/44*
U.S. Cl. 542—417 **4 Claims**

1. A compound of the formula:



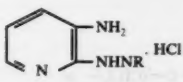
wherein R is H_2, benzylidene or 3,4-dimethoxybenzylidene and n is 1 or 2.

4,121,036
3-AMINO-2-HYDRAZINOPYRIDINE DERIVATIVES

George C. Wright, Norwich, and James L. Butterfield, New Berlin, both of N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Feb. 22, 1977, Ser. No. 770,581
Int. Cl.[2] **C07D** *213/77;* **A61K** *31/44*
U.S. Cl. 542—417 **4 Claims**

1. A compound of the formula:



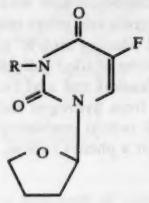
wherein R is 3,4-dimethoxybenzylidene, 4-hydroxybenzylidene or isopropylidene.

4,121,037
PROCESS FOR PRODUCING 5-FLUOROURACIL DERIVATIVE WITH A CALCIUM CHLORIDE CATALYST

Toshio Nakamura, Ohmiya; Yasuo Hoshide, Tokyo; Yoshio Hashimoto, Gyoda; Kenichi Suzuki, Saitama, and Yohji Yoshida, Kawaguchi, all of Japan, assignors to Nikken Chemicals Co., Ltd., Tokyo, Japan

Filed Mar. 3, 1977, Ser. No. 774,050
Claims priority, application Japan, Jun. 26, 1976, 51-75713; Aug. 28, 1976, 51-102800
Int. Cl.[2] C07D *239/54*
U.S. Cl. 544—313 14 Claims

1. A process for producing a 5-fluorouracil derivative having the formula



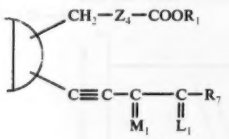
wherein R represents a hydrogen atom or a 2-tetrahydrofuryl group which comprises reacting more than an equimolar amount of 2,3-dihydrofuran with 5-fluorouracil in a polar aprotic solvent in the presence of a catalytically effective amount of calcium chloride as a catalyst under neutral or basic conditions at a reaction temperature of 50 to 150° C under at least autogenous pressure.

4,121,038
3,7-INTER-M-PHENYLENE-3-OXA-13,14-DIDEHYDRO-11-DEOXY-17-PHENYL-4,5,6,18,19,20-HEXANOR-PGF$_1$ COMPOUNDS

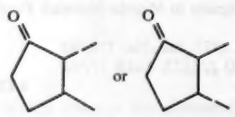
Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 657,740, Feb. 13, 1976. This application Aug. 1, 1977, Ser. No. 820,966
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—53 73 Claims

1. A prostaglandin analog of the formula

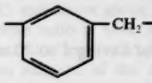


wherein D is

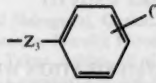


wherein Z_4 is

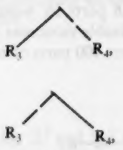
-continued



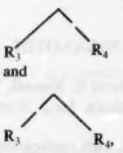
wherein g is 1, 2, or 3;
wherein R_7 is



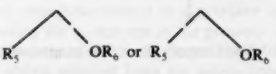
wherein Z_3 is oxa or methylene, s is 0, 1, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of 1 to 3 carbon atoms, inclusive, or alkoxy of 1 to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;
wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl, with the further proviso that one or both of R_3 and R_4 is fluoro only when Z_3 is methylene;
wherein M_1 is



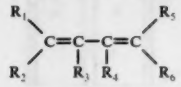
wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen; and
wherein R_1 is hydrogen, alkyl of 1 to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with 1, 2, or 3 chloro or alkyl of 1 to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,121,039
PROCESS FOR PRODUCING AN UNSATURATED GLYCOL DIESTER USING A CATALYST COMPRISING PALLADIUM CONTAINING THORIUM AS A PROMOTOR

R. Parthasarathy, and Eugene Victor Hort, both of Wayne, N.J., assignors to GAF Corporation, New York, N.Y.

Filed Sep. 26, 1977, Ser. No. 836,479
Int. Cl.[2] C07C *67/05*
U.S. Cl. 560—244 **16 Claims**

1. A process for the production of unsaturated diesters, which comprises reacting in a liquid phase a conjugated diene of the formula:



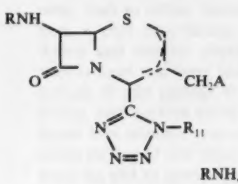
wherein R_1, R_2, R_3, R_4, R_5 and R_6 may be same or different and each represents hydrogen or an alkyl group having 1 to 6 carbon atoms, a carboxylic acid selected from the group consisting of aliphatic, aromatic and alicyclic carboxylic acid having 2 to 20 carbon atoms, and oxygen in the presence of a supported solid catalyst consisting essentially of elemental palladium containing thorium as a promotor.

4,121,040
4-(TETRAZOL-5-yl)-Δ^3-CEPHEM COMPOUNDS

Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

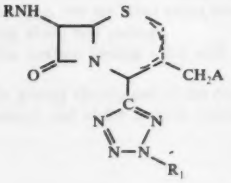
Division of Ser. No. 658,303, Feb. 17, 1976, Pat. No. 4,045,436, which is a division of Ser. No. 508,634, Sep. 23, 1974, Pat. No. 3,966,719, which is a continuation-in-part of Ser. No. 407,097, Oct. 17, 1973, abandoned. This application Apr. 27, 1977, Ser. No. 791,522
Int. Cl.[2] C07D *501/18*
U.S. Cl. 544—28 **13 Claims**

1. A compound selected from the group consisting of



I

and



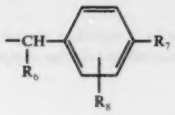
II

wherein R is selected from the group consisting of 2,2,2-trichloroethoxycarbonyl, 2,2,2-tribromoethoxycarbonyl and benzyloxycarbonyl;

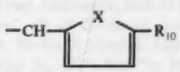
A is selected from the group consisting of hydrogen and acetoxy;

R_1 is selected from the group consisting of hydrogen and alkanoyloxymethyl having from three to six carbon atoms, 1-(alkanoyloxy)ethyl having from four to seven carbon atoms, methoxymethyl, and phthalidyl;

and R_{11} is selected from the group consisting of hydrogen, alkanoyloxymethyl having from three to six carbon atoms, 1-(alkanoyloxy)ethyl having from four to seven carbon atoms, methoxymethyl, phthalidyl,



wherein R_6 is selected from the group consisting of alkyl having from one to three carbon atoms and phenyl and R_7 is selected from the group consisting of hydroxy, methoxy, alkanoyloxy having two to four carbon atoms, and benzyloxy and R_8 is selected from the group consisting of hydrogen, hydroxy, fluoro, chloro, bromo, iodo, methyl, methoxy, alkanoyloxy having from two to four carbon atoms, phenyl and benzyloxy and



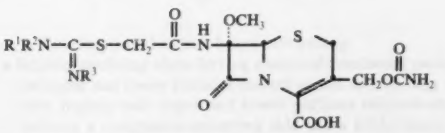
wherein R_9 and R_{10} are each selected from the group consisting of hydrogen and methyl and X is selected from the group consisting of oxygen and sulfur.

4,121,041
7-(AMIDINOTHIO)ACETAMIDO-7-METHOXY CEPHALOSPORINS

Robert F. Czaja, Scotch Plains, and Edward J. J. Grabowski, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 4, 1977, Ser. No. 765,477
Int. Cl.[2] C07D *501/40*; A61K *31/545*
U.S. Cl. 544—21 **3 Claims**

1. The compound having the following formula



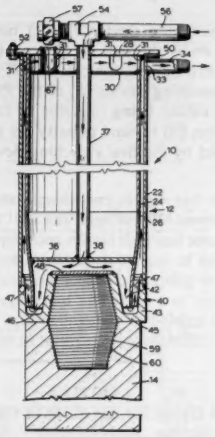
wherein R^1, R^2 and R^3 are the same or different and are hydrogen, loweralkyl of 1–5 carbon atoms, or phenyl.

4,121,042

COMPOSITE ELECTRODE WITH NON-CONSUMABLE UPPER SECTION

Otto E. Prenn, Sherwood Park, Canada, assignor to The Steel Company of Canada Limited, Canada

Filed Oct. 7, 1976, Ser. No. 730,621
Claims priority, application Canada, Sep. 1, 1976, 260316
Int. Cl.[2] H05B 7/07
U.S. Cl. 13—18 R 6 Claims



1. A composite electrode for electric arc furnaces, comprising:

an elongated, substantially cylindrical metallic portion having a top end and a bottom end, the portion including an outer wall of substantially uniform section along its length, the outer wall having an outside surface and an inside surface, an inner wall spaced inwardly from the outer wall to define therewith a passage of annular section, a pipe constituting conduit means longitudinally within said metallic portion, the pipe being spaced inwardly from said inner wall and communicating with the bottom of said passage to allow cooling liquid to move within said portion along a path which brings cooling liquid into intimate contact with substantially all of the inside surface of said outer wall, said path having a downward leg and an upward leg, one leg being along said pipe and the other leg being along said passage,

an elongated consumable portion having a top end and a bottom end,

and connector means for joining the top end of the consumable portion to the bottom end of the metallic portion.

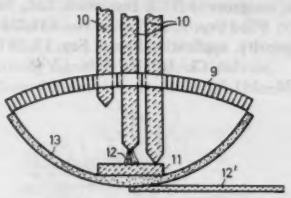
4,121,043

PREHEATING METALLURGICAL ENCLOSURES

Bo Vesteras Rappinger, Vesteras, Sweden, assignor to Asea Aktiebolag, Vesteras, Sweden

Filed Apr. 26, 1977, Ser. No. 790,946
Claims priority, application Sweden, May 24, 1976, 7605840
Int. Cl.[2] F27D 23/00
U.S. Cl. 13—34 9 Claims

1. A method for preheating a metallurgical enclosure having a refractory lining which after preheating is exposed to the heat of molten metal, said method comprising enclosing said lining in a substantially gas-tight manner and forming an elec-



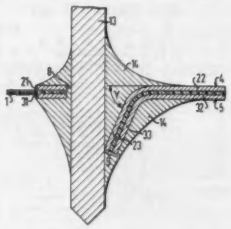
tric open arc producing arc radiation at a location inside of said enclosure so as to expose said lining directly to said radiation.

4,121,044

FLEXIBLE THROUGH-CONTACTED PRINTED CIRCUITS

Hans Hadersbeck; Ernst Andrascek, both of Munich, and Alfred Groeber, Stockdorf, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 26, 1976, Ser. No. 690,272
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1975, 2524581
Int. Cl.[2] H05K 1/00
U.S. Cl. 174—68.5 7 Claims



1. A flexible printed circuit board comprising:

a flexible insulating sheet having electrical conductor paths on upper and lower portions thereof at and surrounding a core region, said upper and lower portions respectively defining a component-mounting side and a solder-applying side;

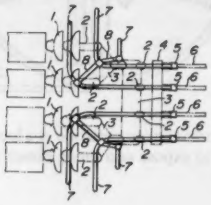
a tongue portion severed from said board at said core regions along a non-closed, convexly-extending line, said tongue portion being attached to said board along a hinge line joining ends of said non-closed line, said tongue portion being bent so as to extend at an angle of less than 90° toward said solder-applying side so that an overstretching of said conductor paths on upper portions of said insulating sheet is safely avoided; and

the tongue portion and conductor paths forming, with solder applied on said solder-applying side of said board and allowed to flow and harden onto said core region and into contact with said conductor paths on upper and lower surfaces of said tongue portions, a substantially perfect through-contact between upper and lower portions of the circuit board.

4,121,045
CORONA SHIELDING BY JUMPER ASSEMBLY

Mankichi Yamada, Inazawa, and Hiroshi Fujita, Inuyama, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Sep. 7, 1977, Ser. No. 831,284
Claims priority, application Japan, Sep. 13, 1976, 52-108830
Int. Cl.[2] H01B *17/44, 17/48*
U.S. Cl. 174—141 R 3 Claims



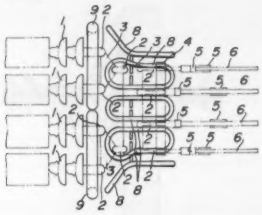
1. An apparatus for corona shielding a plurality of tension insulator strings coupled to a plurality of conductors by line hardware comprising

a plurality of jumper wires connected with said conductors and spaced apart from each other so as to surround the ends of said insulator strings on the energized side and shield said ends and line hardware, thereby preventing corona discharge therefrom.

4,121,046
CORONA SHIELD FOR TENSION INSULATOR ASSEMBLY

Hiroshi Fujita, Inuyama, and Kazuhisa Kato, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Sep. 7, 1977, Ser. No. 831,285
Claims priority, application Japan, Sep. 13, 1976, 51-108829
Int. Cl.[2] H01B *17/44, 17/48*
U.S. Cl. 174—141 R 6 Claims



1. An apparatus for corona shielding a high tension insulator assembly having a plurality of insulator strings anchoring a plurality of conductors with line hardware comprising

at least three shielding rings substantially surrounding the line hardware at the anchored ends of said conductors but not said insulator strings, each ring having a substantial portion thereof forming a respective plane extending substantially along the longitudinal direction of said conductors.

4,121,047
CIRCUIT ARRANGEMENT FOR THE SWITCHING ON AND OFF OF A TELEPRINTER PBX EXCHANGE

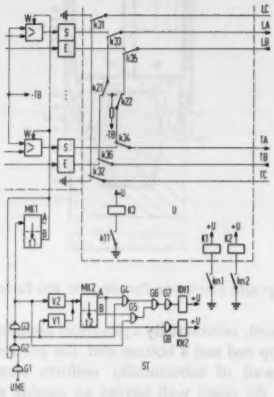
Filip Jejina, Puchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 20, 1977, Ser. No. 817,260
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1976, 2635305
Int. Cl.[2] H04L *15/00*
U.S. Cl. 178—3 3 Claims

1. Circuit arrangement for teleprinter PBX exchanges, in which a switch-over device connects at least a part of the PBX lines directly to the main connection lines upon the switching off of the PBX exchange, and reconnects the PBX lines and the main connection lines both separately and to the PBX exchange on the switching on of the PBX exchange, in order to prevent impermissible connections occurring during the switching off and the switching on of the PBX exchange, the improvement comprising two time-dependent switching devices (MK1, MK2) provided for the analysis of switch-off and switch-on signals (UM=0, UM=1) which respectively characterize the switching off and switching on of the PBX exchange;

said first switching device (MK1) being operable to be switched on by the switch-off signal (UM=0) and operable to switch on a switch circuit (W) which is assigned to each transmitting device (S) of the PBX exchange;

said switch circuit being operable to connect the transmitting devices (S) to start polarity for a period of time (*t*1) determined by the first switching device (MK1);



said second switching device (MK2) being operable to be switched on by the switch-on and the switch-off signals (UM=0, UM=1) and having assigned thereto first and second control switching means (KN1, KN2), a switchover device (U) having first switching means (K1, K3) connected to said first control switching means to directly connect the wires (TA, TB, TC) of the PBX lines to the wires (LA, LB, LC) of the main connection lines, or to separately connect these lines to the PBX exchange; and

second switching means (K2) which is arranged in the switchover device (U) and is operable to be controlled by the second control switching means (KN2) to connect start polarity (−TB) to the wires (LA, TA) leading in the direction of reception for a period of time (*t*2) determined by the second switching device (MK2), in each case prior to the switchover of the main connection lines and the PBX lines.

4,121,048
MULTIPLE SHIFT ELECTRONIC KEYBOARD

Rathindra N. Dev Choudhury, Ithaca, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed Jul. 28, 1977, Ser. No. 819,788
Int. Cl.[2] B41J *25/24;* H04L *15/06*
U.S. Cl. 178—17 C 14 Claims

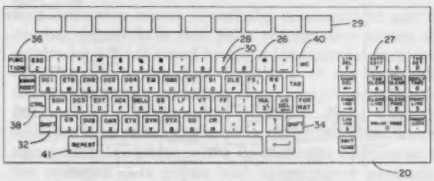
1. In a keyboard encoding system of the type which is operated in response to the depression of a first key member representing a selected character for generating coded data representing the key depressed, a circuit operable upon the depression and release of a second key member for generating coded data for use in selecting a second character in response to the depression of the first key member comprising:

(a) means for generating a plurality of first signals;

(b) means for transmitting said first signals to said first and second key members for sensing the depression of said first and second key members;

(c) circuit means responsive to the depression and release of said second key member for generating a plurality of said first signals;

(d) and encoding means operable in response to the genera-



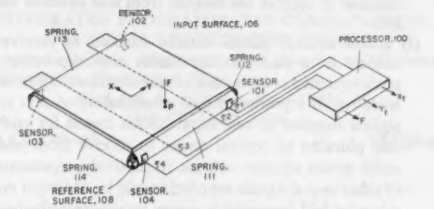
tion of said first signals and connected to said circuit means and said first key member for receiving said first signals upon depression of said first and second key members and said first signal upon release of said second key member, said encoding means outputting coded data representing the depression and release of said second key member for use in selecting a second character in response to the depression of said first key member.

4,121,049

POSITION AND FORCE MEASURING SYSTEM

Frederick W. Roeber, Concord, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Apr. 1, 1977, Ser. No. 783,538
Int. Cl.[2] G08C *21/00*; G01G *3/14*
U.S. Cl. 178—18 **28 Claims**



1. In combination:

first and second substantially rigid bodies;

spring means interconnecting said rigid bodies, said spring means extending along substantially the entire periphery of said substantially rigid bodies, said spring means restraining lateral movement between said first and second substantially rigid bodies; and

means for producing electrical signals representing a change in distance between portions of said substantially rigid bodies in response to a force applied to one of said bodies.

4,121,050

DIFFERENTIAL TRI-PHASE SHIFT KEYED MODULATION

Richard P. Witt, Weston, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 2, 1977, Ser. No. 765,026
Int. Cl.[2] H04L *27/24*
U.S. Cl. 178—67 **1 Claim**

1. In a differential tri-phased shift keyed modulation system a phase comparator for the detection of data transmission shift keyed modulation comprising

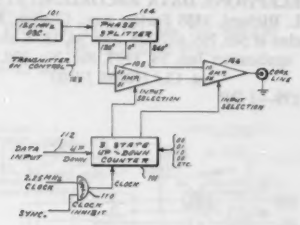
a signal receiving source,

a center tapped delay line having a total storage duration equal to the system transmission signalling rate,

a first phase shifter, said delay line and said first phase shifter being fed from said signal receiving source,

a first phase demodulator being fed simultaneously by the center tap of said delay line and by said first phase shifter wherein said first phase demodulator develops a clock synchronizing signal at the system data rate,

a second phase shifter driven by said signal receiving source,



a second phase demodulator receiving the outputs of said delay line and said second phase shifter for the detection of the received signal data content,

a third phase shifter driven by said signal receiving source, and

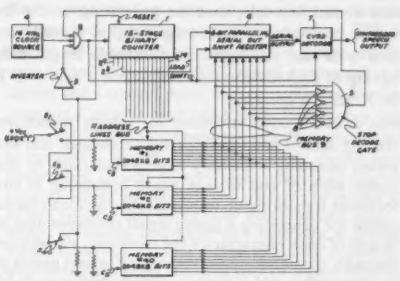
a third demodulator, said third phase demodulator being driven by said delay line and said third phase shifter and adjusted to detect pauses occuring in the shifting of transmission signal phase.

4,121,051

SPEECH SYNTHESIZER

Harry Place, Ridgewood, N.J., assignor to International Telephone & Telegraph Corporation, Nutley, N.J.

Filed Jun. 29, 1977, Ser. No. 811,009
Int. Cl.[2] G10L *1/00*
U.S. Cl. 179—1 SM **17 Claims**



1. A speech synthesizer comprising:

N first means each having N phonetic sounds stored therein in digital form, where N is an integer greater than one;

second means each coupled to a different one of said first means to select desired phonetic sounds in digital form from an addressed one of said first means;

third means coupled to said second means to convert said selected desired phonetic sounds in digital form to analog synthesized speech; and

a fourth means coupled to said first means and said second means to automatically stop the operation of said third means for short phonetic sounds;

said first means including

N memories; and

said second means including

N switch means each coupled to a different one of said memories to select said desired phonetic sounds,

a clock source,

a binary counter to generate a different address for each of said memories, and

an AND gate coupled to said switch means, said clock source and said fourth means to control the coupling of the clock of said source to said counter.

4,121,052

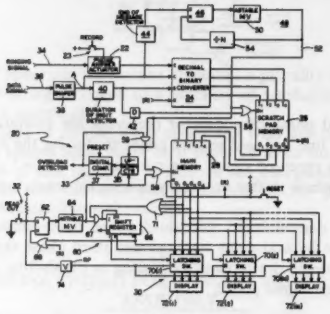
TELEPHONE DATA RECORDING SYSTEM

Herbert L. Richard, 1555 Farlow Ave., Crofton, Md. 21113

Continuation of Ser. No. 652,325, Jan. 26, 1976, abandoned. This application Jun. 16, 1977, Ser. No. 808,196

Int. Cl.[2] H04M *17/00*

U.S. Cl. 179—2 DP **6 Claims**



1. A system for transferring messages via telephone lines comprising:

means for generating a call signal from a first telephone to a second telephone over the telephone lines;

means at said second telephone for detecting said call signal and in response thereto causing said second telephone to capture the telephone lines;

means at said first telephone for generating on the lines a single, complete, variable length digital message associated with said call signal, said variable length message having M digitally encoded characters, where $1 \leqq M \leqq N$, N being a constant;

means at said second telephone for storing successive, incoming ones of said variable length messages, said storage means including a memory having a plurality of storage banks, each of said storage banks containing N storage locations for storing up to N digitally encoded characters, means for generating a gating signal corresponding to the length of each character of the incoming, variable length message, converter means responsive to said gating signal for converting said incoming, digital characters to binary coded signals, means for detecting the end of the incoming, variable length message, pulse generator means for generating N pulses, means for shifting said binary coded signals into said memory in response to the N pulses generated by said pulse generator, means responsive to said end of message detecting means for operating said pulse generator to shift the M binary coded characters of said incoming message into an N stage storage bank of said memory, (N–M) storage locations of said bank thereby remaining empty;

display means at said second telephone for visually displaying only one complete message; and

readout means at said second telephone for successively reading out single ones of said stored messages to said display means, said readout means displaying the content of only one storage bank each time said readout means is activated, each readout containing a single complete, stored message.

4,121,053

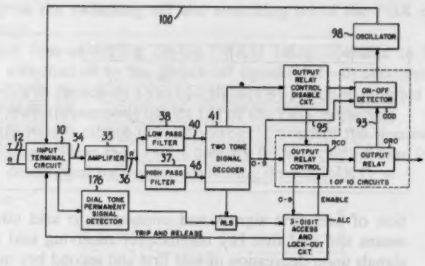
TELEPHONE COMMAND APPARATUS

William J. Dick, 188-20A 69th Ave., Flushing, N.Y. 11365

Filed May 5, 1977, Ser. No. 793,958

Int. Cl.[2] H04M *11/00*

U.S. Cl. 179—2 A **16 Claims**



1. Telephone command apparatus comprising

(a) signal transmission channel means,

(b) input circuit means connectible to a telephone line and responsive to telephone ringing signals for conditioning said signal transmission means to transmit signals therethrough,

(c) decoder means in said transmission channel means for providing a plurality of separate outputs representative, respectively, of a plurality of coded signals supplied as inputs thereto through said channel means,

(d) a plurality of controllable means for effecting a plurality of operations, respectively,

(e) a plurality of control means for actuating said respective controllable means, said control means being initially disabled to receive the outputs from said decoder means, and

(f) access control means initially enabled to receive the outputs from said decoder means and responsive to a predetermined combination of said separate outputs representative of a predetermined combination of first coded signals supplied to said input circuit means for enabling said plurality of control means to receive from said decoder means separate outputs, respectively, representative of other coded signals supplied to said input circuit means, whereby said controllable means may be selectively actuated in response to said other coded signals supplied to said input circuit means from said telephone line.

4,121,054

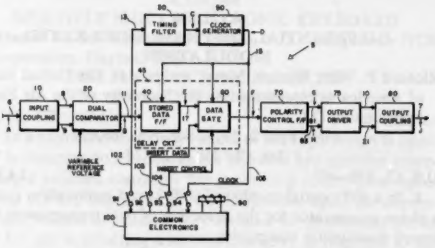
REGENERATIVE LINE ACCESS MODULE

Philip Popkin, Orlando, Fla., assignor to Martin Marietta Corporation, Orlando, Fla.

Filed Jan. 3, 1977, Ser. No. 756,194

Int. Cl.[2] H04J *3/08*

U.S. Cl. 179—15 BD **12 Claims**



1. A line access module having input and output, and

adapted to be connected in a series relationship to a digital data transmission line carrying a data pulse stream, said module comprising:

pulse regeneration means for receiving attenuated and distorted data signals at the input of said module, and for producing reshaped data signals at the output of said module, said pulse regeneration means comprising a dual comparator having a selectable reference threshold voltage;

timing extraction means electrically connected to and receiving signals from said pulse regeneration means, for producing a clock signal having a fundamental frequency equal to the fundamental frequency of the data pulse stream, said timing extraction means comprising means for filtering out a fundamental sinusoidal signal from the reshaped data pulses and shifting the phase of the filtered signal from the phase of the fundamental component of the reshaped data pulses, and square wave generation means responsive to the zero crossings of the filtered sinusoidal signal for producing said clock signal;

data gating means having two states, said data gating means electrically connected between said pulse regeneration means and said output of said module for passing the reshaped data signals to said output when said gating means is in the first of said states, and for blocking the reshaped data signals from reaching said output when said gating means is in the second of said states, said data gating means also connected to said timing extraction means to receive the clock signals therefrom; and

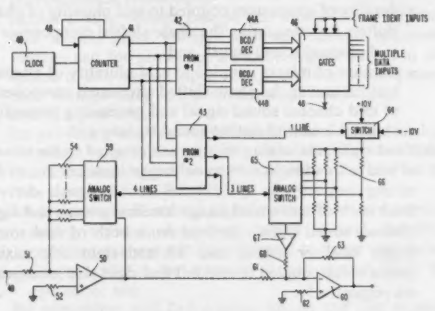
relay means having contacts connected to said data gating means whereby operation of said relay means places said data gating means in said second state in response to externally-generated data signals and connects externally-generated data signals to said data gating means.

4,121,055

INTEGRATED PROGRAMMABLE COMMUTATION AND SIGNAL CONDITIONING CIRCUIT

Michael J. Doherty, Warrington, Pa., assignor to Microcom Corporation, Warminster, Pa.

Filed Jun. 6, 1977, Ser. No. 803,636
Int. Cl.[2] H04J *3/04*
U.S. Cl. 179—15 A **14 Claims**



10. A functionally integrated commutation and conditioning circuit, for deriving a commutated signal from a multiplicity of data inputs, comprising:

a. a commutating path having a plurality of inputs connected to multiple data channels, for successively gating sampled signals from respective ones of said data channels to derive a multi-channel commutated signal;

b. a conditioning path connected to the output of said commutating means, and having means for providing a plurality of respective conditioning operations for each channel of said commutated signal; and

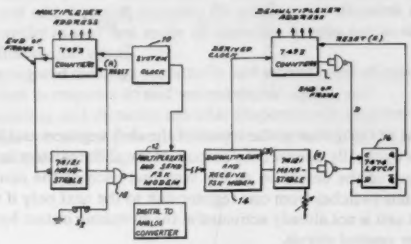
c. means for synchronizing and programming the operation of said commutating means and said conditioning path, whereby said conditioning path operates with respective programmed characteristics for the time interval of each successive channel of said commutated signal.

4,121,056

TIME DIVISION DIGITAL MULTIPLEXER APPARATUS

James E. Stout, Raymore, Mo., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 14, 1977, Ser. No. 806,435
Int. Cl.[2] H04J *9/00*
U.S. Cl. 179—15 BM **6 Claims**



1. An improved multiplexed data transmission system of the type wherein a plurality of input data signals and a clock signal are frequency division multiplexed for transmission over voice grade transmission circuits, wherein the improvement comprises:

a delay equalization and frame synchronization apparatus comprising in combination:

a sending unit for generating a system clock frequency and a plurality of output signals derived from said system clock frequency, said sending unit generating an end of frame signal which initiates a reset pulse, said reset pulse disables the generation of said plurality of output signals and enables a send modem, said send modem modulates said system clock frequency to provide an output FSK signal,

a receive unit receiving said output FSK signal, said receive unit demodulating said FSK signal to provide a clock carrier and a control pulse, said control pulse is utilized to generate a receive reset pulse, said clock carrier which is phase-locked with said system clock frequency is utilized to provide a plurality of receive output signals upon the occurrence of said receive reset pulse, said plurality of receive output signals and said plurality of output signals in said sending unit being fully synchronized, and,

a digital to analog converter unit receiving a plurality of digital input signals, said digital to analog converter unit sequentialy sampling said plurality of digital input signals and converting them into serial data, said serial data being applied to a sinusoidal oscillator with a first and second oscillating frequency, said sinusoidal oscillator providing an FSK output signal in response to said serial data.

4,121,057

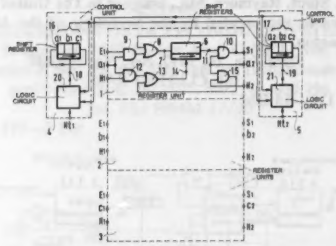
FRAME SYNCHRONIZING DEVICE

Jacques Luder, Ris-Orangis, France, assignor to Societe Anonyme dite Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Aug. 2, 1977, Ser. No. 821,220
Claims priority, application France, Aug. 20, 1976, 76 25345
Int. Cl.[2] H04J *3/06*
U.S. Cl. 179—15 BS **6 Claims**

1. A device for synchronising a "frame" of a first data pulse train at a first bit rate to a second data pulse train at a second bit rate, the device comprising a memory, and first and second control circuits for activating respectively the loading of the memory in synchronism with "frame" pulses of the first pulse

train, and the unloading of the memory in synchronism with "frame" pulses of the second pulse train; wherein the memory is constituted by three looped shift register units, each having a capacity of one complete frame, and wherein the two control circuits have identical structures and cyclically connect the



input of the device to the inputs of the shift registers and likewise cyclically connect the outputs of the shift registers to the output of the device in such a way that each of the control circuits switches from one register unit to the next only if that next unit is not already activated at the switching instant by the other control circuit.

4,121,058

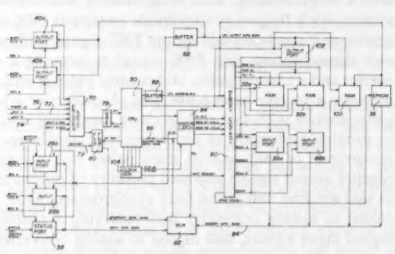
VOICE PROCESSOR

Stephen C. Jusko, Point, and Thomas C. Tillotson, Greenville, both of Tex., assignors to E-Systems, Inc., Dallas, Tex.

Filed Dec. 13, 1976, Ser. No. 749,999

Int. Cl.[2] G11B *13/00*

U.S. Cl. 179—15.55 T **27 Claims**



1. Apparatus for rate conversion of audio signals, comprising in combination:

data storage means having address locations for storing digital data representing audio signals,

means for transferring digital data representing an audio signal to write address locations in said data storage means at an input rate,

means for retrieving the digital data from read address locations in said data storage means at a readout rate independent of the input rate,

means for monitoring the address differential between the read address locations and the write address locations,

means for resetting the means for retrieving at a preselected address differential from said means for transferring when the address differential exceeds preestablished maximum or minimum limits, and

means for generating an audio signal in analog format from the retrieved digital data at the readout rate.

4,121,059

SOUND FIELD EXPANDING DEVICE

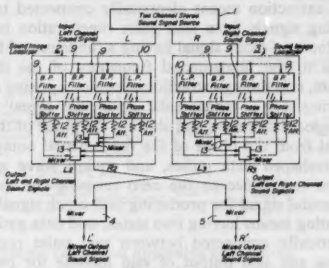
Katsumi Nakabayashi, Kawasaki, Japan, assignor to Nippon Hoso Kyokai, Japan

Filed Apr. 12, 1976, Ser. No. 675,784

Claims priority, application Japan, Apr. 17, 1975, 50-45773

Int. Cl.[2] G11B *31/00*

U.S. Cl. 179—100.1 TD **3 Claims**



1. A sound field expanding device for generating a sound field expanded with respect to an original sound field, said original sound field being that produced by left and right loudspeakers obliquely positioned in front of a listener in the absence of said expanding device, comprising,

left and right side sound image localizer means for receiving left and right channel sound signals respectively from a two channel stereo sound signal source and shifting the left and right side sound images to the left and right sides of the listener to produce an angular displacement of the sound images that is greater than that produced by said original sound field, each of said localizer means including

a plurality of filters coupled to said sound signal source to receive a corresponding channel sound signal, said filters passing succeeding frequency band components of said channel sound signal,

a plurality of phase shifters coupled to said plurality of filters for adjusting the phases of the frequency band components of said channel sound signal,

a plurality of attenuators coupled to said plurality of phase shifters for attenuating the phase-shifted components of said channel sound signal, and

a plurality of mixers coupled to said plurality of attenuators for mixing the phase-shifted attenuated components of said channel sound signal and generating respective channel localized output sound signals; and

left and right side mixing means each coupled to the mixers of said left and right side sound image localizer means for mixing respectively left channel sound signals derived from both of said sound image localizer means and right channel sound signals derived from both of said sound image localizer means, said left and right side mixing means being coupled to said left and right side loudspeakers respectively.

4,121,060

TOUCH BUTTON SWITCH FOR DICTATION HANDSET

Alan Earl Bohnhoff, Loxley, Ala., assignor to Lanier Business Products, Inc., Atlanta, Ga.

Filed Mar. 30, 1977, Ser. No. 782,894

Int. Cl.[2] G11B *19/16*

U.S. Cl. 179—100.1 DR **5 Claims**

1. A dictation system including a dictation recorder having first and second modes of operation and a dictate station from which said first and second modes of operation of said dictation recorder may be controlled by an operator, wherein the improvement comprises a control switch apparatus for use in said dictate station by said operator for controlling said first

and second modes of operation of said dictation recorder from said dictate station, comprising:

a first input voltage means for providing a first input voltage in response to the electrical contact of said first input voltage means with said operator;

said first input voltage means including a first contact surface having a first voltage,

a second contact surface separated from said first contact surface by an insulating material and having a second voltage, and

a means for changing the voltage of at least one of said first and second contact surfaces to said first input voltage in response to the electrical interposition of said operator between said first contact surface and said second contact surface;

a second input voltage means for providing a second input voltage in response to the electrical contact of said second input voltage means with said operator; said second input voltage means including

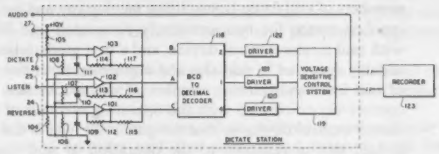
a third contact surface having a third voltage,

a fourth contact surface separated from said third contact surface by an insulating material and having a fourth voltage; and

a means for changing the voltage of at least one of said third and fourth contact surfaces to said second input voltage in response to the electrical interposition of said operator between said third contact surface and said fourth contact surface;

a reference voltage means for providing a first reference voltage and a second reference voltage;

a first analog voltage comparison means for comparing said first input voltage with said first reference voltage and for



providing a first digital output in response to said first input voltage and said first reference voltage being in a predetermined relationship;

a second analog voltage comparison means for comparing said second input voltage with said second reference voltage and for providing a second digital output in response to said second input voltage and said second reference voltage being in a predetermined relationship;

a control signal means:

for providing said first digital output from said first analog voltage comparison means to said dictation recorder as a first control signal to cause said dictation recorder to be operated in said first mode of operation;

for providing said second digital output from said second analog voltage comparison means to said dictation recorder as a second control signal to cause said dictation recorder to be operated in said second mode of operation; and

for preventing said first control output and said second control output from being provided to said dictation recorder simultaneously in response to the simultaneous input of said first digital output from said first analog voltage comparison means and of said second digital output from said second analog voltage comparison means.

5. A dictation system including a dictation recorder having a first mode of operation and a second mode of operation, a dictate station from which said dictation recorder can be controlled by an operator, wherein the improvement is a control system comprising:

first input switch means having a first contact surface and a second contact surface electrically isolated from said first contact surface for providing a first input voltage in response to the electrical interposition of said operator between said first contact surface and said contact surface;

second input switch means having a third contact surface and a fourth contact surface electrically isolated from said third contact surface for providing a second input voltage in response to the electrical interposition of said operator between said third contact surface and said fourth contact surface;

first comparator means for providing a first digital signal in response to said first input voltage;

second comparator means for providing a second digital signal in response to said second input voltage;

decoder driver means operatively interconnected with said first comparator means and said second comparator means and said dictation recorder for placing said dictation recorder in said first mode of operation in response to said first digital signal,

placing said dictation recorder in said second mode of operation in response to said second digital signal, and

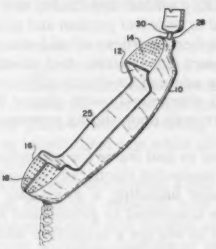
rendering said dictation recorder inoperative in response to the concurrent presence of said first digital signal and said second digital signal.

4,121,061

TELEPHONE HOLDER

Robert G. Donaldson, Chicago, Ill., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Aug. 10, 1977, Ser. No. 823,517
Int. Cl.[2] H04M *1/05*
U.S. Cl. 179—156 R **2 Claims**



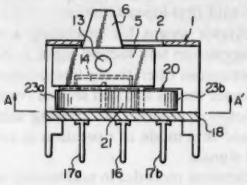
1. A holder for removably fitting about and holding a telephone hand set therein comprising a one-piece cradle for said hand set; said cradle having a hollow ear piece-receiving first cup, a smaller, hollow mouthpiece-receiving second cup connected to said first cup by a hollow, open body portion; and an arcuate, head-engaging member adapted to fit over and embrace the head of the wearer, which head-engaging member is attached to an end wall of the said first cup, wherein said cradle is formed of a resilient material, with the first and second said cups formed with a perforated cover section, in which

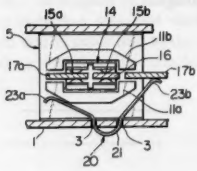
a through slot is formed in the cover section of the mouthpiece-receiving second cup to divide the said cover section, with said slot continuing along an end wall of the said second cup and terminating at a rounded rim end which bounds an opening of a size to provide a passaage for a telephone cord extending from the mouthpiece end of the telephone hand set fitted in said holder.

4,121,062
CHANGE-OVER SLIDE SWITCH WITH GROUNDING SPRING MEMBER

Hitoshi Fujino, Furukawa, Japan, assignor to Alps Electric Co., Ltd, Japan

Filed Apr. 29, 1977, Ser. No. 792,400
Claims priority, application Japan, May 1, 1976, 51-55617[U]
Int. Cl.[2] H01H *15/02*
U.S. Cl. 200—16 F 1 Claim





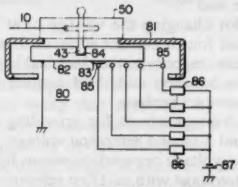
1. A change-over switch comprising
a metal frame having an open end;
a base plate attached to the open end of said frame and comprised of an electrically insulating material;
a row of terminals aligned on said base plate, said row including two stationary terminals and a common terminal therebetween;
a slider comprised of an electrically insulating material and received slidably within said frame, said slider having a recess formed in its lower portion and projections extending from peripheral portions of said recess;
a movable contact fixed within said recess, said movable contact being adapted to electrically connect said common terminal alternatively with one or the other of said stationary terminals upon sliding movement of said slider; and
means connected to said frame for grounding the stationary terminal not connected electrically to said common terminal, said means including a grounding spring member adapted to be connected to ground and having two arms each adapted to engage a respective stationary terminal, whereby upon sliding movement of said slider to connect a selected stationary terminal to said common terminal, said projection moves between said selected stationary terminal and the arm engaged thereto for isolating said selected terminal from ground.

4,121,063
POWER TRANSMISSION FLAT CABLE FOR REMOTE-CONTROLLED ELECTRICAL APPARATUS

Mitsuo Aimi, Kadoma, Japan, assignor to Matsushita Electric Industrial Co., Limited, Japan

Filed Mar. 2, 1976, Ser. No. 663,060
Claims priority, application Japan, Jun. 3, 1975, 50-75708[U]; Jun. 25, 1975, 50-90146[U]
Int. Cl.[2] H01H *3/00*
U.S. Cl. 200—18 7 Claims

1. Apparatus for controlling an electrical characteristic from a remote location, comprising:
a master control device having a manually operating member operable to variable positions in response to an external force applied thereto;
an electrical circuit device having a mechanical operating member permitting the same to provide a variable electrical characteristic in response to variable positioning of said master control device;
a force-transmitting mechanism comprising an elongated, planar, force-transmitting member, longitudinally spaced sections, extending transversely of said force-transmitting member and overlying different sides of the same, and a pair of longitudinally extending planar guide members having portions connecting said spaced sections and to which said sections are rigidly connected, said force-transmitting member and said guide members having an equal thickness and disposed on a same plane, said guide members cooperating with said transverse sections to retain said force-transmitting member against lateral escape;
a first connector connected at one end of said force-transmitting mechanism, comprising a first block formed with a first guide slot and connected with one end of said guide



members of said force-transmitting mechanism and including first means for nonoperatively connected said block with said master control device, and a first guide follower slidably received in said slot and connected with one end of said force-transmitting member of said mechanism and operatively connected with the operating member of said master control device so that the guide follower is slidable in said slot in response to the operation of said master control device;
a second connector connected at the opposite end of said force-transmitting mechanism, comprising a second block having a second guide slot and connected with the opposite end of said guide members of said mechanism and including second means for nonoperatively connected said second block with said electrical circuit device, and a second guide follower slidably received in said second slot and connected with the opposite end of said force-transmitting member and operatively connected with the operating member of said electrical circuit device so that the second guide follower is slidable in response to the movement of the first guide follower.

4,121,064
IGNITION DISTRIBUTOR HAVING INDEPENDENT IGNITION SYSTEM BREAKER ARM CONTACTS SIMULTANEOUSLY ENGAGING COMMON CONDUCTIVE POST

Yasuo Nakajima, Yokosuka; Yoshimasa Hayashi, Yokohama, and Makio Waku, Urawa, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 10, 1977, Ser. No. 776,213
Claims priority, application Japan, Mar. 11, 1976, 51/28870[U]
Int. Cl.[2] H01H *19/00*
U.S. Cl. 200—19 A 2 Claims

2. In an internal combustion engine having at least one combustion chamber, two spark plugs disposed in the combustion chamber, a first and a second independent ignition system each of which is connected to one of said spark plugs, for energizing said spark plugs at the same ignition timing, an intake system

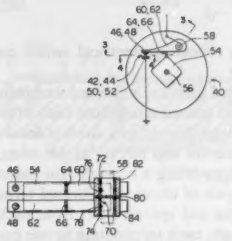
for supplying therethrough a mixture of air and fuel to the combustion chamber, an exhaust system for discharging therethrough the exhaust gases emitted from the combustion chamber and an exhaust gas recirculation system for recirculating a portion of the exhaust gases from the exhaust system to the intake system, an ignition distributor comprising:

a pair of spaced apart fixed contacts;

a cam driven to rotate around an axis thereof in timed relation with the engine and having an axially uniform periphery;

a pivot post parallelly off-set from the axis of said cam;

first and second breaker arms mounted on said pivot post one above the other and each having a contact engaging one of said fixed contacts, each of said breaker arms also having a rubbing block engaged by said cam for pivoting each of said breaker arms away from one of said fixed contacts;



said fixed contacts and the contacts of said breaker arms constituting two sets of breaker contacts respectively connected to a different one of said independent ignition systems;

a pair of insulating bushings each of which is mounted on one of said breaker arms to insulate each of said breaker arms from pivot post; and

an insulating washer mounted on said pivot post and interposed between said first and second breaker arms for insulation between said breaker arms, in which said breaker arms are of an identical configuration so that said rubbing blocks engage the periphery of said cam at a circumferentially identical position thereof such that upon rotation of said cam, said two sets of breaker contacts open and close at exactly the same instant to produce the said same ignition timing.

4,121,065

TOGGLE SWITCH LEVER LOCK

Tony O. Woodard, Pine Level, N.C., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Oct. 31, 1977, Ser. No. 846,682

Int. Cl.[2] H01H *3/20, 9/20*

U.S. Cl. 200—42 T **8 Claims**

1. A lockable toggle lever operated device comprising: a pivoted toggle lever having a handle portion at its upper end;

a support comprising a bushing providing a pivot supporting said toggle lever at an intermediate portion thereof extending through the bore of said bushing for pivotal movement to operate said device;

an actuator at the lower end of said toggle lever comprising a spring-biased plunger engaging said device and biasing said toggle lever up against said pivot while allowing limited depression thereof against the force of said spring-biased plunger;

lever guiding means comprising flat surfaces on first opposite sides of said toggle lever and a guide plate mounted to said support having an elongated slot cooperating with said flat surfaces to guide said toggle lever for non-rotatable pivotal movement in one plane while allowing said limited depression thereof;

and lever locking means comprising interference means on the other opposite sides of said toggle lever normally above said guide plate and being operative following depression of said toggle lever and a quarter turn rotation thereof for providing locking interference between said interference means and the edges of said slot to prevent pivotal movement of said toggle lever out of its center position.

4. A lockable toggle lever switch comprising:

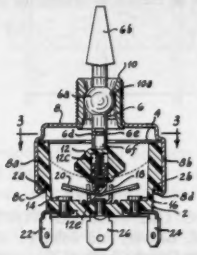
a pivotal toggle lever having a handle at its external end and arranged to pivot from its center position in at least one direction;

a housing comprising an electrically insulating base and a frame connected thereto;

said frame having a bushing including a bore with means therein pivoting said toggle lever at an intermediate point for movement to operate said switch;

stationary contact means within said housing connected through said base to external terminals;

movable contact means within said housing selectively operable to "on" position closing a circuit with respect to said stationary contact means or to "off" position opening said circuit;



a contact actuator coupled to the lower end of said toggle lever comprising spring-biased means engaging said movable contact means and biasing said toggle lever up against said pivoting means while allowing limited downward depression thereof against the force of said spring-biased means;

lever guiding means comprising flat portions on opposite sides of said toggle lever and means mounted within said housing providing parallel edges coacting with said flat portions to confine the pivotal movement of said toggle lever to one plane while preventing rotary movement thereof on its longitudinal axis while allowing said limited depression thereof;

and lever locking means comprising a pair of grooves in said toggle lever extending between said flat portions and normally spaced above said parallel edges of said lever guiding means affording rotation of said toggle lever a quarter turn on its longitudinal axis, following depression of said toggle lever against the force of said spring-biased means enough to lower said grooves to the level of said parallel edges of said lever guiding means, thereby to cause said guiding edges to enter said grooves and to lock said toggle lever against pivotal movement from said center position.

4,121,066

CIRCUIT BREAKER ADAPTER

Charles Horowitz, Niles, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.

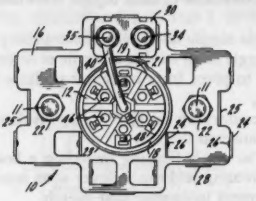
Filed Jun. 16, 1977, Ser. No. 807,022

Int. Cl.[2] H02B *1/10;* **H01H** *37/52, 61/01*

U.S. Cl. 200—51 R **3 Claims**

1. A circuit breaker conversion adapter for use on a conventional electrical connector receptacle not having circuit breakers thereon, said adapter comprising a mounting plate having a

generally circular opening for positioning said plate on a connector receptacle, said mounting plate having spaced holes positioned for alignment with the conventional mounting bolts of a connector receptacle, said mounting plate having upstanding flange means, a plurality of circuit breakers, said circuit



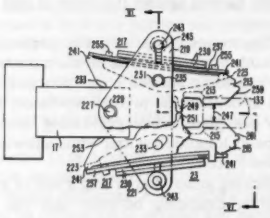
breakers and flange means having cooperating mounting means thereon, each circuit breaker having an electrical terminal adapted to receive a wire from an electrical harness, each circuit breaker having a second electrical terminal for receiving one end of a second wire which is adapted to be connected to a contact pin of an electrical connector receptacle.

4,121,067

CONTACT STRUCTURE FOR DRAWOUT SWITCHGEAR

James O. Rexroad, Beaver, and John P. Majcher, Chippewa Township, Beaver County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 5, 1977, Ser. No. 757,104
Int. Cl.[2] H01H *1/50*
U.S. Cl. 200—50 AA **6 Claims**



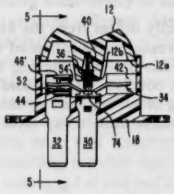
1. Drawout switchgear comprising a cell having an opening at the front thereof, stationary primary terminal stab supported in the cell, stationary secondary terminal stab supported in the cell, a circuit interrupting unit movable into and out of the cell, movable primary terminal means on the circuit interrupting unit movable with the circuit interrupting unit, movable secondary terminal means on the circuit interrupting unit movable with the circuit interrupting unit, each movable terminal means comprising a terminal support, at least one pair of oppositely disposed contact fingers for engaging the terminal stab, means biasing said pair of fingers toward each other into engagement with said terminal support, said biasing means comprising leaf springs disposed on the outer sides of said pair of contact fingers to provide said biasing means, bracket means for holding said contact fingers and said terminal support and said contact fingers together, and the bracket means extending between and restrainingly engaging the leaf springs substantially centrally thereof.

4,121,068

POLARITY REVERSING ELECTRICAL SWITCH

Vincent W. Peck, Waltham, Mass., assignor to TRW Inc., Cleveland, Ohio

Filed Feb. 28, 1977, Ser. No. 772,378
Int. Cl.[2] H01H *13/28*
U.S. Cl. 200—67 G **20 Claims**



1. A polarity reversing electrical switch comprising

A. a housing

B. a first pair of identically formed terminals mounted in said housing and spaced apart from each other, each terminating at one end thereof in a contact for connection into an electrical circuit and having at the other end a cradle for rockably supporting a contact arm therein,

C. a second pair of identically formed terminals mounted in said housing and spaced apart from each other and from said first pair, each terminating at one end in a contact for connection into said circuit and having at the other end integral first and second contact surfaces spaced apart from each other, said terminals being positioned in said housing such that the first contact surface of each terminal lies opposite the second contact surface of the opposite terminal to thereby form mixed pairs of contact surfaces, and

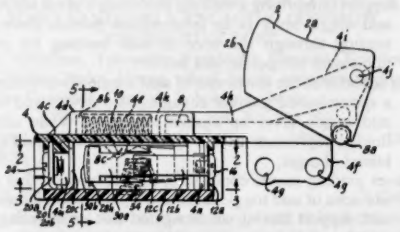
D. a pair of contact arms rockably seated in said cradles of the first terminal pair and extending intermediate said contact surfaces, each arm being rotatable into contact with a corresponding pair of the opposed contact surfaces of the second terminal pair to thereby selectively electrically interconnect the first and second terminal pair in either of two configurations in accordance with the position of said arms.

4,121,069

SNAP-ACTION ELECTRIC SWITCH WITH FULCRUM MEANS FOR LIMITED CONTACT SLIDING AND POSITIVE-OFF TORQUE

Eric L. Long, Mequon, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Aug. 19, 1976, Ser. No. 715,898
Int. Cl.[2] H01H *5/06*
U.S. Cl. 200—67 A **20 Claims**



1. In an electric switch comprising an upwardly biased apexed contactor cammed downwardly from above by a mov-

able operator to snap laterally against stationary contact means as the apex is crossed by the operator;

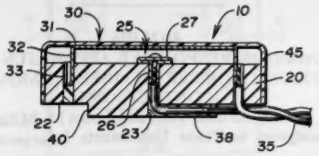
the improvement comprising fulcrum means effective during disengagement of said stationary contact means to stop the downward movement of said contactor before said operator crosses said apex to thereby form a moment arm to the point of operator-contactor engagement such that further movement of said operator towards said apex exerts a torque on said contactor to pivot said contactor away from said stationary contact means until said apex is crossed.

4,121,070

ENCLOSED PUSH BUTTON TYPE SWITCH

John P. Silbernagel, Crystal, Minn., assignor to Renal Systems, Inc., Minneapolis, Minn.

Filed Mar. 4, 1977, Ser. No. 774,249
Int. Cl.[2] H01H *9/04*
U.S. Cl. 20—67 DB **10 Claims**



1. A single enclosed, sealed push button switch comprising:

a base frame having top and bottom surfaces and having a plurality of mounting holes therein substantially perpendicular to said top and bottom surfaces;

a centrally located contact member having connector means mounted in one of said holes with a contact member projecting from the top surface of said base frame;

a second contact member having connector means and overlying the first named contact member and having a substantially flat upper surface, said second contact member having flanges extending normal to the flat surface to space the flat surface from the first contact member;

connector means included in said flanges projecting through other of said holes in said base frame for mounting said second contact member on said base frame;

lead wires extended substantially perpendicular to the bottom surface of said base frame through said mounting holes and connected to said connector means of said contact members;

corrosion-resistant sealing means sealing said mounting holes through which said lead wires extend; and corrosion-resistant enclosure means fitted over and substantially conforming in shape with said base frame and enclosing said contact members, said enclosure means being flexible on the surface adjacent said contact members to enable depression of the same to move said second contact member into engagement with the first named contact member, said enclosure means being bonded through a corrosion-resistant adhesive to said base frame to completely hermetically seal the entire switch thereby preventing the entry of any moisture and corrosive debris from entering the switch to cause malfunctioning of said switch.

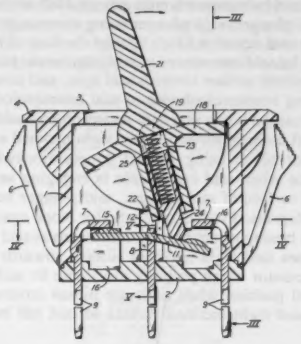
4,121,071

ELECTRIC SWITCH

Dudley H. Campbell, and Arthur W. Overton, both of Raleigh, N.C., assignors to Stackpole Components Company, Raleigh, N.C.

Filed Feb. 17, 1977, Ser. No. 769,556
Int. Cl.[2] H01H *13/28*
U.S. Cl. 200—67 G **2 Claims**

1. An electric switch comprising a housing having a separate base attached to one end and an opening at the opposite end, an electric end contact secured to each end of the base inside the housing, central electric terminal means secured to the central part of the base between said end contacts and projecting from the housing, terminals carried by the base outside of the housing and connected to said end contacts, a rigid metal strip forming a bridging contact having a central portion resting on the inner end of said central terminal means and rockable thereon, the end contacts having portions overlying the end portions of the bridging contact, said base and all of the contacts and terminals forming together a base unit in which the bridging contact cannot escape from between said base and



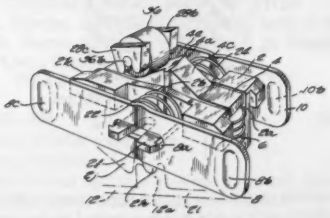
said overlying portions of the end contacts before the base is secured to the rest of the switch housing, and manually operable actuating means extending down through said housing opening and engaging the upper surface of the bridging contact for rocking that contact on said central terminal means to electrically connect the latter with the overlying portion of either of said end contacts, at least one end portion of the bridging contact being provided with a longitudinal slot extending inwardly from the end of that contact, a rigid dielectric member extending into said slot from said base to restrict lateral movement of the bridging contact.

4,121,072

SNAP-ACTION OVERCENTER SWITCH HAVING AN APEXED PLUNGER DEPRESSIBLE IN A ROCKABLE ACTUATOR BLOCK

Harold W. Hults, New Berlin, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Jun. 9, 1976, Ser. No. 694,388
Int. Cl.[2] H01H *13/28*
U.S. Cl. 200—67 A **15 Claims**



1. An electric switch comprising:

housing means;

an actuator block pivotally mounted on said housing means;

an apexed plunger carried by said actuator block for pivotal movement therewith and depressible therein transversely of the pivotal axis thereof;

means biasing said plunger outwardly of said actuator block;

operator means movably mounted to said housing means and having cam means engaging said plunger against the bias of said biasing means and translationally movable across the apex thereof to cause snap-action over-center pivoting of said actuator block when said cam means crosses said apex in response to movement of said operator means; and

contact means actuated by said actuator block;

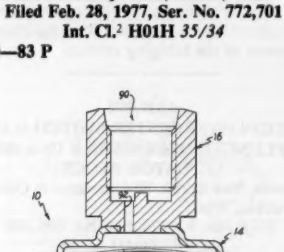
wherein said actuator block has two stable positions, a clockwise pivoted position and a counterclockwise pivoted position, and wherein said plunger has left and right oppositely inclined camming surfaces meeting at said apex, said actuator block being insaid clockwise pivoted position when said cam means is engaging said left inclined surface of said plunger, said plunger being cammingly depressed within said actuator block against the bias of said biasing means by said cam means as said cam means traverses said left inclined surface towards said apex, said actuator block pivoting counterclockwise to said counterclockwise pivoted position when said cam means crosses said apex from said left inclined surface to said right inclined surface, said actuator block being in said counterclockwise pivoted position when said cam means is engaging said right inclined surface of said plunger, said plunger being cammingly depressed within said actuator block against the bias of said biasing means by said cam means as said cam means traverses said right inclined surface towards said apex, said actuator block pivoting clockwise to said clockwise pivoted position when said cam means crosses said apex from said right inclined surface to said left inclined surface.

4,121,073

CONDITION RESPONSIVE ELECTRICAL SWITCH HAVING IMPROVED BRIDGING CONTACT MEANS

Thomas Bileski; Joe W. Crawford, both of Dallas; Bobby D. Blanton, Seagoville; Carl N. Johnson, Dallas; Felix Garcia, Garland; John W. Orcutt, Garland; Glen C. Shepherd, Garland, and James A. Oursler, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 28, 1977, Ser. No. 772,701
Int. Cl.[2] H01H 35/34
U.S. Cl. 200—83 P **14 Claims**



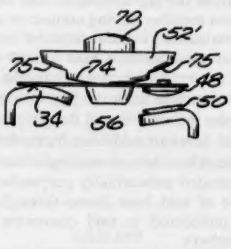
1. Condition responsive switch apparatus comprising a housing, condition actuatable means mounted in the housing movable to and from first and second configurations upon the occurrence of preselected conditions, a pair of spaced stationary electrically conductive contact members disposed in the housing, an electrically conductive element having at least four legs, the first and second legs extending along one straight line and the third and fourth legs extending along another straight line, the straight lines intersecting one another, the first and second legs adapted to move into electrical engagement and disengagement with the pair of stationary contacts forming a closed circuit path between the stationary contacts when the element is in electrical engagement therewith and an open circuit path when the element is in disengagement therewith, reaction stop surfaces formed in the housing, the third and fourth legs having distal end portions disposed on the stop surfaces, the stop surfaces located in the housing such that a first force is exerted on the element tending to maintain the first and second legs in one of two positions of engagement and disengagement with the stationary contacts, the condition actuatable means adapted to exert a second force on the element when the condition actuatable means is in one of the first and second configurations larger than and opposing the first force so that the first and second legs are maintained in the other of the two positions of engagement and disengagement with the stationary contacts, when the condition actuatable means is in the other of its first and second configurations no second force is exerted on the element so that the first force maintains the first and second legs in the one of the two positions of engagement and disengagement with the stationary contacts.

4,121,074

CONDITION RESPONSIVE APPARATUS WITH MOTION TRANSFER MEMBER TO MOVABLE CONTACT ARM

John W. Orcutt, Garland, Tex., and James M. Mills, Lexington, Ky., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 29, 1977, Ser. No. 837,970
Int. Cl.[2] H01H 35/34
U.S. Cl. 200—83 P **10 Claims**



1. A condition responsive device comprising a base formed of electrically insulative material defining a switch chamber therein, a switch means disposed in the chamber including a movable contact arm and first and second terminal members, the movable contact arm cantilever mounted on a distal end of the first terminal member and having a free end portion mounting a movable contact thereon adapted to move into and out of electrical engagement with a distal end of the second terminal member, the movable contact having the contact engaging surface on one side of the movable contact arm and a portion extending through and projecting from an opposite side of the movable contact arm, means defining an opening in the base communicating with the switch chamber, condition responsive means mounted at the open end of the base adapted to move from a first position to a second position and back upon being exposed to preselected conditions to respectively close and open an electrical circuit from the first terminal through the movable contact arm to the second terminal, and a motion transfer member slidably disposed intermediate the movable contact arm and the condition responsive means, the member having a curved bottom surface extending over a major portion of the length of the movable contact arm so that movement of the condition responsive means from the first position

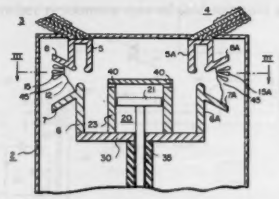
to the second position causes the motion transfer member to bend the movable contact arm to conform to the bottom surface configuration of the motion transfer member to thereby distribute impact forces from the condition responsive means along the length of the movable contact arm, and a recess formed in the curved bottom surface to receive therein the projecting portion of the movable contact when condition responsive means is in the second position.

4,121,075

DOUBLE-BREAK PUFFER-TYPE COMPRESSED-GAS CIRCUIT-BREAKER

Masaharu Tanaka, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 26, 1976, Ser. No. 745,251
Claims priority, application Japan, Nov. 27, 1975, 50-141888
Int. Cl.[2] H01H *33/88*
U.S. Cl. 200—148 A **6 Claims**



1. A high-voltage double-break compressed-gas circuit-interrupter of the puffer-type including means defining a gas-filled enclosure, means providing a pair of spaced stationary contact structures disposed within said gas-filled enclosure, each of said relatively-stationary contact structures having an outwardly-extending arcing horn (8), a movable U-shaped rod-like conducting bridging member having outwardly-extending arcing horns disposed at the outer extremities thereof, the inner extremity of each of the two arcing horns constituting a movable contact which is engageable with a respective stationary contact for arc generation, a common gas-compressing piston-and-cylinder arrangement disposed generally centrally within said gas-filled enclosure including a common piston-part and a common cylinder-part, means mechanically connecting one of said common parts to the generally-central portion of said movable U-shaped rod-like conducting bridging member to be carried thereby for causing the simultaneous actuation of said common gas-compressing arrangement with establishment of said double series arcs, a pair of oppositely-directed gas-ejector aperture openings associated with said common gas-compressing piston-and-cylinder arrangement for directing a pair of oppositely-directed flows of compressed gas into the two serially-related arcs to effect thereby their extinction, and the outer leg portions of said movable U-shaped rod-like conducting bridging member being disposed in such close proximity that the oppositely-directed current flows within said two leg portions will generate an electromagnetic field about each leg portion to thereby repel the two generated arcs outwardly upon the two pairs of arcing horns while the arcs themselves are simultaneously reacted upon by the two outwardly-directed gas-jet flows.

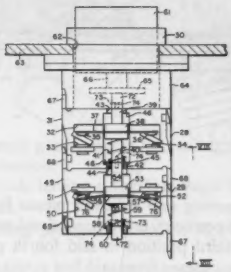
4,121,076

CONVERTIBLE SWITCH

Glenn R. Taylor; John H. Mullen, both of Brighton Township, Beaver County, and Stephen S. Dobrosielski, Beaver, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 653,043, Jan. 28, 1976, abandoned. This application May 5, 1977, Ser. No. 793,996
Int. Cl.[2] H01H *13/04*
U.S. Cl. 200—280 **1 Claim**

1. A convertible switch structure comprising a push button actuator, and at least two contact blocks stacked in end-to-end surface abutment; each contact block having a dielectric housing including opposite end walls and opposite side walls forming a contact compartment, each block having stationary and movable contacts; each block also having movable contact operating means including a guided reciprocable plunger, the opposite end walls of each contact block having plunger-receiving openings; the openings of each contact block being aligned, the plungers of adjacent contact blocks being in end-to-end abutment, one plunger being operatively connected to the push button actuator, each movable contact operating means also comprising a bridging contact member upon which the movable contacts are mounted, said means also comprising spring means for biasing the plunger toward the push button operator, the stationary contacts being mounted in the compartment adjacent one end wall thereof, the push button actuator comprising a casing having a bottom wall in abutment with



the end wall of a contact block, the casing and housings having interlocking means for holding the actuator and switch blocks together; the interlocking means comprising similar latching hooks, one hook at one corner of the block and another hook only at a diagonally opposite corner of the block, each block also having cooperating in-turned latching surfaces only at other diagonally opposite corners, the hooks being detachably engaged with the latching surfaces, the casing also having latching hook means on one side and cooperating in-turned latching surface means on the other side which latching means engage corresponding interlocking means on the adjacent contact block, the opposite walls of each contact block being reversely mounted with respect to an adjacent block or casing to effect conversion of said block between normally open and normally closed contact modes, and the movable contact operating means being reversible within the compartment when the corresponding contact block is reversely mounted.

4,121,077

CIRCUIT BREAKER HAVING IMPROVED MOVABLE CONTACT POSITION INDICATOR

Stephen A. Mrenna, and Glenn R. Thomas, both of Brighton Township, Beaver County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

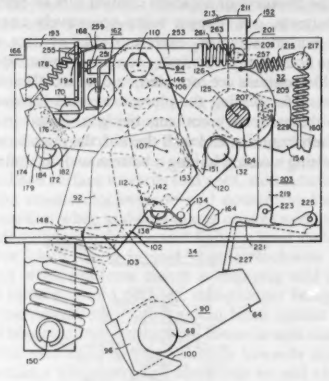
Filed Jun. 29, 1977, Ser. No. 811,227
Int. Cl.[2] H01H *9/16, 50/06*
U.S. Cl. 200—308 **10 Claims**

1. A circuit breaker comprising:
a stationary contact;
a movable contact operable between open and closed positions with respect to said stationary contact;
a movable contact holder coupled to, and movable with, said movable contact;
means for effecting movement of said movable contact between said open and closed positions including a rotatable drive shaft;
indicator means, mounted on but independently movable from said drive shaft, operable between first and second positions for indicating the position of said movable contact with respect to said stationary contact, said indi-

cator means being in said first position when said movable contact is in said closed position and said indicator means being in said second position when said movable contact is in said open position;

biasing means for biasing said indicator means in said first position; and

connection means operable between third and fourth positions for moving said indicator means from said first to said second positions, movement of said connection means from said third position to said fourth position moving said indicator means from said first position to said second position, said contact holder contacting said connection means upon movement of said movable contact from said closed to said open position and moving said connection means from said third to said fourth position.



4,121,078

MICROWAVE HEATING APPARATUS

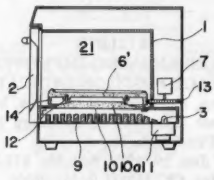
Teruhisa Takano, Osaka; Noboru Kurata, Nara; Shigeru Kusunoki, Yamatokoriyama, and Hirofumi Yoshimura, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 27, 1976, Ser. No. 680,809

Claims priority, application Japan, Apr. 30, 1975, 50-52974; Apr. 30, 1975, 50-52977; May 7, 1975, 50-54981

Int. Cl.[2] H05B *9/06*

U.S. Cl. 219—10.55 F **21 Claims**



1. A microwave heating apparatus comprising wall means defining a heating chamber, at least one surface waveguide means for producing surface wave energy and disposed in said heating chamber, oscillator means in said apparatus actuable to produce a microwave output at least part of which is coupled to said surface waveguide means, a cover made of dielectric material, said cover being disposed within said heating chamber in a position above and close to said surface waveguide means so as to cover the surface of said surface waveguide means for stabilization of electromagnetic wave characteristics of said surface waveguide means and for preventing soiling of said surface waveguide means, and a support table for an article to be heated disposed adjacent to the upper surface of said cover for supporting an article to be heated thereon, said support table and said waveguide means being relatively movable parallel to the plane of the surface of said support table, and driving means connected with one of said support table and said waveguide means for producing said relative movement.

4,121,079

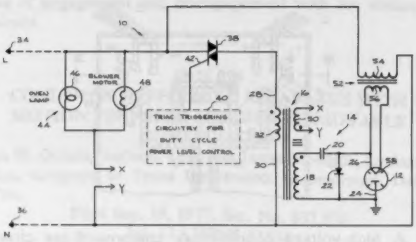
MINIMIZING LAMP FLICKER AND BLOWER SPEED VARIATION IN A MICROWAVE OVEN EMPLOYING DUTY CYCLE POWER LEVEL CONTROL

Larry R. Harmon, Jeffersontown, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Apr. 25, 1977, Ser. No. 790,582

Int. Cl.[2] H05B *9/06*

U.S. Cl. 219—10.55 B **5 Claims**



1. A microwave oven circuit comprising:

a power transformer connected to energize a magnetron;

a duty cycle controlled switching element connected to periodically energize said power transformer from an AC power source which supplies voltage and current, the voltage available from the AC power source dropping slightly during those intervals when said power transformer is energized and loads the power source;

means including at least one load device energized constantly from the AC power source for which it is desirable to minimize voltage variations; and

a low voltage secondary winding on the power transformer connected in series with said constantly energized means and phased to provide a voltage boost to said constantly energized means upon energization of the power transformer, thereby to approximately compensate for the drop in available AC voltage.

4,121,080

WIRE ELECTRODE VIBRATION DAMPER

Johann Janicke, Haute-Savoie, France, assignor to Ateliers des Charmilles, S.A., Geneva, Switzerland

Filed Jun. 24, 1976, Ser. No. 699,355

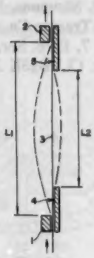
Claims priority, application Switzerland, Jul. 7, 1975, 8825/75

Int. Cl.[2] B23P *1/08*

U.S. Cl. 219—69 W **16 Claims**

1. In a support and guiding means for a wire electrode in an electro-erosion machining apparatus wherein said wire electrode is fed into a machining zone between a pair of support and guiding members permitting longitudinal displacement of said wire electrode in a predetermined direction, said wire electrode having an unsupported portion of a given length, the improvement for damping transverse oscillations of the unsupported length of said wire electrode comprising a pair of bearing surfaces disposed between the support and guiding members for providing a variation of the unsupported length of said wire electrode as a function of the direction of transverse oscillation of said wire electrode, each of said bearing surfaces

being disposed parallel to the axis of said wire electrode, said bearing surfaces being of different lengths and disposed at an



angle to each other proximate one of said support and guiding means.

4,121,081

APPARATUS FOR AND METHOD OF REFEEDING ELECTRODES IN AN ELECTRICAL DISCHARGE MACHINING APPARATUS

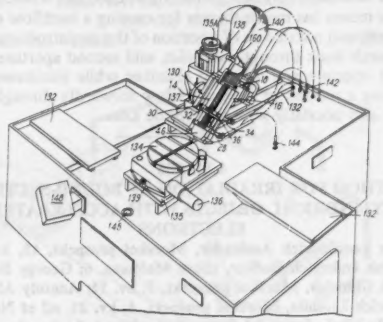
George Edward Baker, Asfordby, near Melton Mowbray, England, assignor to Amchem Company Limited, Silbey, England

Filed Oct. 12, 1976, Ser. No. 731,571

Claims priority, application United Kingdom, Oct. 15, 1975, 42164/75

Int. Cl.[2] B23P *1/08*

U.S. Cl. 219—69 E 15 Claims



2. An electrical discharge machining apparatus for machining a workpiece, said apparatus comprising a nose guide, an electrode cartridge having means for containing at least one electrode, the cartridge being mounted for rectilinear movement with respect to said nose guide of the apparatus with part of the length of each electrode supported in the nose guide, a clamp releasably clamping each electrode in the cartridge and means offering frictional resistance to the passage of each electrode through the cartridge when the clamp is released, and means for advancing the cartridge and each frictionally retained electrode towards the nose guide beyond the portion where each electrode will engage an associated workpiece, each electrode being received back into the cartridge upon striking the workpiece.

4,121,082

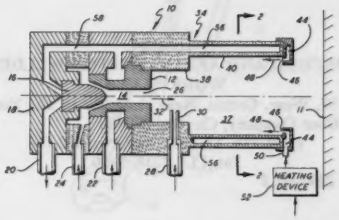
METHOD AND APPARATUS FOR SHIELDING THE EFFLUENT FROM PLASMA SPRAY GUN ASSEMBLIES

John H. Harrington, Warwick; Richard T. Smyth, and John D. Weir, both of Huntington, all of N.Y., assignors to Metco, Inc., Westbury, N.Y.

Filed Apr. 27, 1977, Ser. No. 791,478

Int. Cl.[2] B23K *9/04*

U.S. Cl. 219—76.16 51 Claims



1. A plasma spray gun assembly for coating substrates comprising, in combination:

a nozzle electrode having a nozzle passage therethrough;

a rear electrode;

means for passing plasma-forming gas through the nozzle electrode;

means for passing an arc-forming current between said electrodes to form a plasma effluent;

means for introducing spray coating material into the plasma effluent;

a wall shroud for said plasma effluent extending from the exit of the nozzle electrode; and

means for forming a hot gas shroud for said plasma effluent at least within the wall shroud.

4,121,083

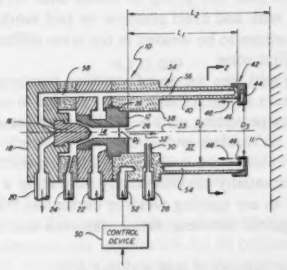
METHOD AND APPARATUS FOR PLASMA FLAME-SPRAYING COATING MATERIAL ONTO A SUBSTRATE

Richard T. Smyth, Huntington, N.Y., assignor to Metco, Inc., Westbury, Long Island, N.Y.

Filed Apr. 27, 1977, Ser. No. 791,479

Int. Cl.[2] B23K *9/04*

U.S. Cl. 219—76.16 42 Claims



1. A plasma spray gun assembly for coating substrates comprising, in combination;

a nozzle electrode having a nozzle passage therethrough;

a rear electrode;

means for passing plasma-forming gas through the nozzle electrode;

means for passing an arc-forming current between said electrodes to form a plasma effluent;

means for introducing spray coating material into the plasma effluent;

a wall shroud for said plasma effluent extending from the exit of the nozzle electrode; and

means for forming a flame shroud for said plasma effluent at least within the wall shroud.

4,121,084

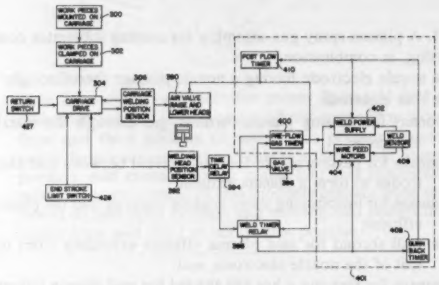
METHOD AND APPARATUS FOR WELDING WORKPIECES

Charles W. Wear, Gretna, Nebr., assignor to The Youngstown Steel Door Company, Cleveland, Ohio

Filed Feb. 17, 1976, Ser. No. 658,716

Int. Cl.[2] B23K 9/00

U.S. Cl. 219—91.2 **2 Claims**



1. A method of welding workpieces to provide a structure having a plurality of areas with joined and bonded locations with at least one of said areas being different in depth than the depth of one of its adjacent areas, which method includes the combination of steps of:

providing at least one group of arc welding heads in a predetermined spatial arrangement;

moving said workpieces under said one group of heads;

stopping said workpieces in a position of orientation such that a first zone on the workpieces which includes portions of more than one of said areas different in depth are under said one group of heads;

lowering of said one group of heads until they come into contact with and exert pressure on said workpieces adjacent locations to be welded in the areas different in depth in said first zone;

activating said one group of welding heads to weld said workpieces at said locations to be welded in said first zone including providing a flow of shielding gas at said locations to be welded; and,

feeding welding wire towards said locations to be welded and substantially simultaneously activating a power supply and an arc igniting welding current so that a welding arc is ignited between the workpieces and the welding wire;

sensing the ignition of said welding arc;

adjusting the speed of feeding the welding wire and the magnitude of the welding current to provide a more uniform weld;

stopping the feeding of welding wire;

burning back the welding wire until a welding arc no longer exists;

turning off the welding power supply;

stopping the flow of the shielding gas; and,

lifting said one group of welding heads.

4,121,085

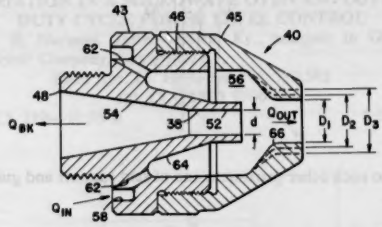
GAS NOZZLE FOR LASER WELDING

Donald P. Diemer; Joseph C. Hafele; Robert H. Hawkins, all of Peoria, and Gerald P. Simmons, Washington, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 7, 1976, Ser. No. 684,229

Int. Cl.[2] B23K 27/00

U.S. Cl. 219—121 L **8 Claims**



1. A laser system comprising a housing defining a chamber within said housing, mirror means mounted in said chamber in said housing, a first aperture in said housing for receiving a laser beam from a laser beam source, a second aperture in said housing for allowing exiting of said laser beam after it has been reflected by said mirror means, nozzle means defining an inlet and an outlet and a nozzle axis therethrough, said nozzle means being mounted on said housing over said second aperture so that a laser beam passing through second aperture will pass into said inlet and exit from said outlet coaxially with said nozzle axis, said mirror means including a mirror operatively positioned with respect to said nozzle axis, and including a centrally disposed mirror aperture defined therein along said nozzle axis, gas inlet means in said nozzle means for introducing a flow of gas intermediate said inlet and said outlet, said mirror aperture, said second aperture and said nozzle means being unobturated entirely along said nozzle axis so that fluid communication is provided between said chamber and said nozzle means entirely along said nozzle axis, and wherein said nozzle means has means therein for causing a backflow coaxially with said nozzle axis of a portion of the gas introduced into the nozzle back through said inlet, said second aperture, said mirror aperture and into said chamber while simultaneously allowing a portion of the gas to flow forwardly through said outlet also coaxially with said nozzle axis.

4,121,086

METHOD FOR IRRADIATION OF ROUND-SECTION CYLINDRICAL OBJECTS WITH ACCELERATED ELECTRONS

Vadim Leonidovich Auslender, Morskoi prospekt, 15, kv. 24; Gersh Itskovich Budker, ulitsa Maltseva, 6; Georgy Borisovich Glagolev, Morskoi prospekt, 7, kv. 11; Anatoly Alexandrovich Livshits, Morskoi prospekt, 1, kv. 21, all of Novosibirsk; Vitaly Petrovich Perepelkin, ulitsa Lobachevskogo, 10, kv. 60, Moscow; Vladimir Arkhipovich Polyakov, ulitsa Maltseva, 1, kv. 27, Novosibirsk; Lev Vladimirovich Chepel, Tokmakov pereulok, 3, kv. 38, Moscow; Ilya Lvovich Chertok, Morskoi prospekt 16, kv. 11, and Vladimir Georgievich Cheskidov, ulitsa Rubinovaya, 5, kv. 34, both of Novosibirsk, all of U.S.S.R.

Filed May 11, 1977, Ser. No. 795,722

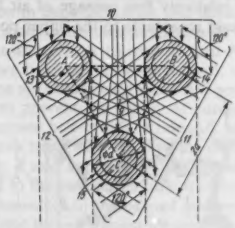
Claims priority, application U.S.S.R., May 12, 1976, 2359068[I]

Int. Cl.[2] B23K 9/00

U.S. Cl. 219—121 EM **3 Claims**

1. A method for irradiation of equally-sized round-section cylindrical objects using accelerated electrons, whereby an irradiation area is formed by directing three ribbon electron beams at an angle of 120° to one another, comprising the step of placing in said irradiated area three said objects to provide

the same irradiation condition to each by arranging that the centers of the cross sections of said objects coincide with the apices of an imaginary equilateral triangle, each side of said imaginary triangle is normal to the direction of one of said electron beams and has a length equal to at least two diameters



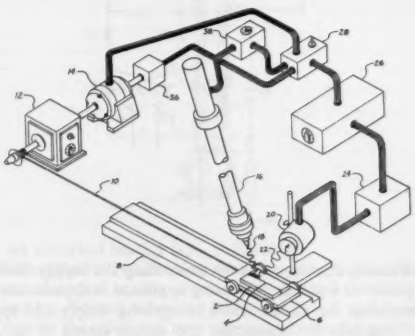
of the cross section of said object, and the width of each said electron beam is not less than a triangle side length plus the diameter of said object; whereby the exposure dose is reduced about three times due to a decrease in the current density on the surfaces of said objects.

4,121,087

METHOD AND APPARATUS FOR CONTROLLING LASER WELDING

Norman D. Malmuth, Westlake Village, Calif.; George Birnbaum, Rockville, Md., and William F. Iceland, Los Alamitos, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 18, 1977, Ser. No. 852,896
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—121 L **15 Claims**



1. A method of heating a surface by radiation comprising the steps of:

(a) projecting a beam of radiation upon a portion of the surface to be heated;

(b) measuring the said radiation reflected by the surface to be heated;

(c) moving the surface to be heated relative to said beam of radiation; and

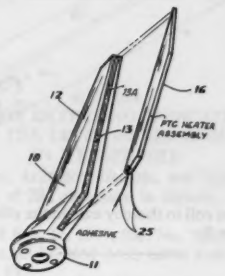
(d) controlling the radiation projected per unit area of the surface being heated as a function of the measured radiation reflected by the surface to be heated.

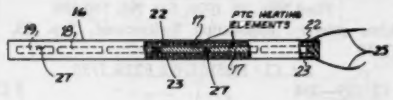
4,121,088

ELECTRICALLY HEATED AIR DATA SENSING DEVICE

John A. Doremus, Wayzata, and William R. Kirkpatrick, Faribault, both of Minn., assignors to Rosemount Inc., Minneapolis, Minn.

Filed Oct. 18, 1976, Ser. No. 733,048
Int. Cl.[2] H05B *3/02*; G01W *1/10*; H01C *7/02*
U.S. Cl. 219—201 **12 Claims**





1. In an air data sensor for an aircraft having deicing heaters installed in the sensor in a position to heat the sensor to prevent icing, wherein said deicing heaters comprise a plurality of PTC heater elements, flexible strip means bonded to the electrically connecting said PTC heater elements in parallel to form a PTC heater assembly, means comprising a flexible, electrically insulating, thermally conductive material embedding said PTC heater assembly, and means to mount the embedded PTC heater assembly on an air data sensor with the thermally conductive material positioned between the PTC heater assembly and adjacent surfaces of the air data sensor and in heat transfer relationship thereto, said flexible strip means being sufficiently flexible to permit the individual PTC heater elements to shift relative to each other under thermal gradients.

4,121,089

APPARATUS FOR THE REVERSAL OF A HOT ROLL IN A FUSING ASSEMBLY

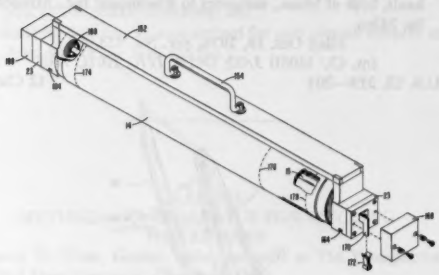
Robert Eugene Bishop, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 29, 1977, Ser. No. 820,272
Int. Cl.[2] H05B *1/00*
U.S. Cl. 219—216 **10 Claims**

1. In a copier of the type having a master document support glass with common side registration for all original documents to be copied, means for creating a visible toner image copy thereof on a sheet of copy paper, and a fuser assembly including a hot roll and backup roll for fusing said toner image onto a sheet of copy paper; said copier being capable of supplying sheets of copy paper of different lengths so that at least one end of the hot roll in the fuser assembly is variably used in accordance with the length of copy sheets used, the improvement comprising:

a symmetrical hot roll mounting mechanism that is removably mounted within the fuser assembly to facilitate man-

ual removal of the hot roll for end-for-end reversal of said hot roll in order that roll wear may be distributed over the



length of the roll to thereby extend the effective usefulness of the hot roll.

4,121,090

WATER-JET ELECTRODE STEAM GENERATOR

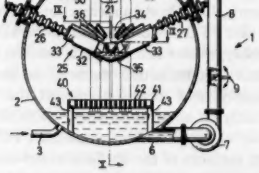
Albert Kuenzli, Wiesendangen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Nov. 10, 1976, Ser. No. 740,659

Claims priority, application Switzerland, Sep. 23, 1976, 12057/76

Int. Cl.[2] H05B *3/60;* F22B *1/30*

U.S. Cl. 219—284 **4 Claims**



1. In an electric steam generator, the combination comprising a vessel;

at least one horizontal dish-shaped water distribution device in said vessel defining a dam to permit water in said device to overflow at least a part of said dam in unthrottled manner for all loads of the steam generator, said distribution device having a shallow conical surface open toward the top to receive water and a plurality of slots extending from a rim of said device towards the center of said device to define the overflow edge of said dam;

a load-proportional water supply means for supplying water to said conical surface of said distribution device; and

an electrode in said vessel below said distribution device for receiving water overflowing said dam in free fall.

4,121,091

APPARATUS FOR HEATING EYEGLASS FRAMES

Richard C. Wareham, 2372 N. 90th St., Milwaukee, Wis. 53227

Division of Ser. No. 664,534, Mar. 8, 1976, Pat. No. 4,054,376, which is a continuation-in-part of Ser. No. 555,436, Mar. 5, 1976, abandoned. This application May 12, 1977, Ser. No. 796,378

Int. Cl.[2] F27D *11/02*

U.S. Cl. 219—400 **9 Claims**

1. A heating device comprising:

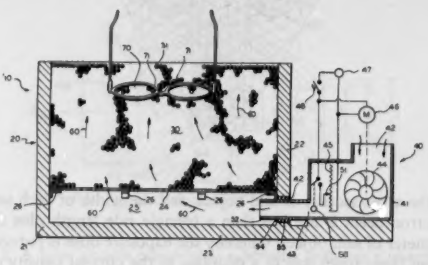
a receptacle having a bottom and side walls and being open at its upper end,

partition means mounted within said receptacle and extending between said side walls for dividing said receptacle into upper and lower portions,

a quantity of heat retentive beads disposed in the upper portion of said receptacle,

said partition means having a multiplicity of openings which are sufficiently small to support said beads but which permit the relatively free passage of air from the lower portion of said receptacle to the upper portion thereof,

heating means,



blower means coupled to the lower portion of said receptacle and to said heating means for delivering heated air to said lower portion from said heating means for passage upwardly through said openings, the pressure of said heated air in the lower portion of said receptacle being maintained at a level which does not substantially exceed atmospheric pressure whereby said beads are agitated by said heated air without fluidization.

4,121,092

ELECTRIC POWER APPARATUS

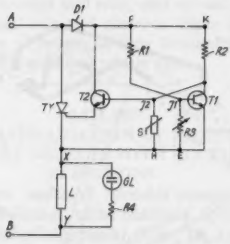
Hans Undin, Akersberga, Sweden, assignor to Pressmaster, Ltd., Stockholm, Sweden

Filed Mar. 23, 1976, Ser. No. 669,443

Claims priority, application Sweden, Mar. 27, 1975, 7503590

Int. Cl.[2] H05B *1/02*

U.S. Cl. 219—501 **8 Claims**



1. Electric circuit means for controlling the supply of electric power to a power consuming appliance in dependence on a parameter, the circuit means comprising supply and appliance terminals for connecting the circuit means to an AC power supply and to said appliance; a first potential divider circuit comprising a first terminal, a second terminal, a first tapping between said first and second terminal, a set point resistor for providing a set point representing a desired value of the parameter as an electrical analogue of said value connected between said first terminal and said first tapping, and a first resistor connected between said second terminal and said first tapping; a second potential divider circuit comprising a third terminal, a fourth terminal, a second tapping between said third and fourth terminal, a sensor responsive to an actual value of the parameter and representing an electrical analogue of said actual value connected between said third terminal and

said second tapping, and a second resistor connected between said fourth terminal and said second tapping; a thyristor for performing a switching operation such as repeatedly to connect a said appliance terminal to, and to disconnect it from, a said supply terminal; a first and a second transistor defining control means for performing a control operation on said switching operation and connecting so as to perform said control operation in dependence on said actual value and on said set point; a diode connected in series with the collector of said second transistor so as to protect said transistors from injurious negative base-emitter voltages and, when said electric circuit means are connected to said AC power supply and said appliance, to prevent the supply of current to the appliance during alternate half-cycles of said AC supply; said first and third terminals being connected to the emitter of said first transistor and to a said appliance terminal, said first tapping being connected to the base of said first transistor, said second tapping being connected to the base of said second transistor, the collector of said second transistor being connected in series with said diode to a said supply terminal, the emitter of said second transistor being connected to the gate of said thyristor, said thyristor being connected between said last-mentioned supply terminal and said last-mentioned appliance terminal, and a second supply terminal also defining a second appliance terminal.

4,121,093

SURFACE HEATING EQUIPMENT

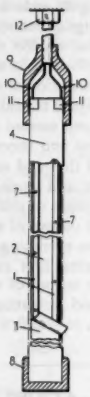
Geoffrey Hugh Wainwright, Hale, England, assignor to Heat Trace Limited, Stockport, England

Filed Nov. 26, 1976, Ser. No. 745,336

Claims priority, application United Kingdom, Nov. 29, 1975, 49185/75

Int. Cl.[2] H05B 3/34

U.S. Cl. 219—528 **4 Claims**



1. An electrical heating tape, comprising:

(a) a longitudinally extending, flexible tape having a continuous electrical heating element incorporated therein, said heating element extending from one end of said flexible tape to the other and over substantially the full width of said flexible tape,

(b) two spaced apart, longitudinally extending, flexible, electrically conductive foils mounted on one face of said flexible tape overlying said heating element,

(c) electrically non-conductive means insulating said foils from said heating element,

(d) a plurality of electrically conductive means each penetrating said non-conductive means to individually electrically connect said heating element to said foils at spaced locations along the length of said foils, said electrically conductive connecting means being individually positioned to effect the connection of said heating element in a plurality of longitudinally extending heating circuits each connected in parallel between said foils, and

(e) an electrically insulating sheath encasing the assembly of said flexible tape and said foils.

4,121,094

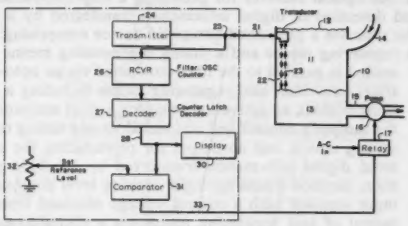
SYSTEM FOR DETECTING, INDICATING AND REGULATING THE LEVEL OF SEMI-SOLID MATTER IN A RESERVOIR

Ronald J. DiVito, Arlington Heights, and Howard A. Steck, Palatine, both of Ill., assignors to Driomi, Inc., Arlington Heights, Ill.

Filed Feb. 16, 1977, Ser. No. 769,012

Int. Cl.[2] G06M 3/02; G01S 9/66

U.S. Cl. 235—92 FL **4 Claims**



1. A system for detecting and indicating the level of sludge in a reservoir, comprising;

a transducer mounted near the top of said reservoir, including an electrical input connection for receiving electrical energy to produce a sonic signal, and likewise operable to produce an electrical signal in response to the receipt of a sonic signal;

a transmitter, connected to generate a train of signals at a reference frequency and apply the reference signals over a common electrical connection to the electrical input connection of the transducer;

a receiver circuit having an input connection coupled to the common electrical connection, for providing an output signal responsive to receipt of an electrical signal from the transducer;

a decoder circuit, connected to receive the receiver output signal and provide an information signal denoting the level of sludge in the reservoir; and

display means, connected to receive the information signal from the decoder and to provide a visible indication of the sludge level;

an outlet conduit near the bottom of said reservoir, and a pump positioned in connected with said conduit to discharge sludge from the reservoir when the pump is energized;

a comparator circuit having first and second input connections, and having an output circuit for regulating energization of the pump;

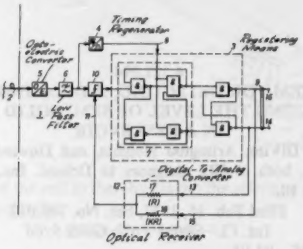
means for establishing a reference level signal at the first input connection of the comparator circuit; and

means for applying the information signal from the decoder circuit to the second input connection of the comparator circuit, such that the comparator circuit output operates to energize the pump when the information signal indicates a sludge level about the reference level.

4,121,095
OPTICAL RECEIVER

György Gezá Endersz, Älvsjö, and Gunnar Stefan Forsberg, Stockholm, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Mar. 16, 1977, Ser. No. 777,970
Claims priority, application Sweden, Apr. 15, 1976, 7604503
Int. Cl.[2] H03K 5/153; H04B 1/10, 9/00
U.S. Cl. 250—199 1 Claim



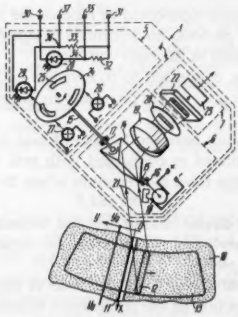
1. An optical receiver for providing a dispersion-compensated detection of digital information transferred by a light pulse train via a fibre conductor, said device comprising:

a registering means and a timing regenerating means connected in parallel to the fibre conductor via an opto-electrical converter, said registering means including a sampling contact, an activation input for a short activation of the sampling contact and connected to said timing regenerating means, and an output for reproducing the registered digital information transferred by the light pulse train, decision means having a decision level determining input supplied with a control voltage obtained from the output of said registering means via a digital-to-analog converting link and being interconnected between the optoelectrical converter and the sampling contact of the registering means, said digital-to-analog converting link having a most significant input connected to a non-inverting pole and a next most significant input connected to an inverting pole of the registering means.

4,121,096
SYSTEM FOR AUTOMATIC CONTROL OF OBJECT BY CONTRAST PROGRAM

Vasily Grigorievich Merezhkin, 10 kvartal, 3 aviagorodok 1, kv. 18, Varketilsky massiv, Tbilisi, U.S.S.R.

Filed Jun. 30, 1977, Ser. No. 811,837
Int. Cl.[2] G05B 1/00
U.S. Cl. 250—202 9 Claims



1. A system for automatic control of an object by a contrast program comprising:

an information scanner producing electrical signals whose combination carries information on the coordinate of said contrast program on an analyzed surface and having an input, which is an input of said system, a signal output, a first marker output and a second marker output, said information scanner including a reference signal generator and a conversion unit for conversion of a specified portion of a radiation flux into an electrical signal carrying information on said contrast program, said conversion unit having an input, which is said input of said information scanner, a first output, and a second output, said unit for conversion including scanning means having an input, which is the input of said conversion unit, a first output and, a second output, and a receiver converting the radiation flux having an input and an output, which is said second output of said conversion unit and serves as said signal output of said information scanner, said input of said receiver being connected to said first output of said scanning means, said reference signal generator producing electrical signals carrying information on the scanning of said analyzed surface and having an input and first and second marker outputs which are, respectively, the first and second marker outputs of said information scanner, said second output of said scanning means being connected to said input of said reference signal generators;

a processing unit for processing the electrical signals carrying information on said contrast program and on said analyzed surface having a signal input, first and second marker inputs, and first and second outputs, said signal input of said processing unit being connected to said signal output of said information scanner, said first and second marker inputs of said processing circuit being connected, respectively, to said first and second marker outputs of said information scanner, said processing unit including a forming unit for forming normalized electrical signals carrying information on said contrast program having a signal input, which is said signal input of the processing unit, and a signal output, and a logical circuit, for processing the electrical signals carrying information on said contrast program and on the scanning of said analyzed surface and for producing the electrical signals carrying information on the deviation of said object from the specified position with respect to said contrast program, having a signal input, first and second marker inputs, which are respectively said first and second marker inputs of said processing unit, and first and second outputs, which are respectively said first and second outputs of said processing unit, said signal input of said logical signal being connected to said signal output of said forming unit; and

an actuating mechanism executing the commands to control said object and having first and second inputs and an output, which is the output of said system, said first and second inputs of said actuating mechanism being connected, respectively, to said first and second output of the processing unit.

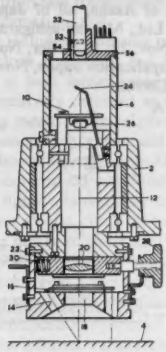
4,121,097
PHOTOELECTRICALLY CONTROLLED LINE FOLLOWER APPARATUS

James English, Eastbourne, England, assignor to BOC Limited, London, England

Filed Jul. 6, 1977, Ser. No. 813,343
Claims priority, application United Kingdom, Jul. 8, 1976, 28549/76
Int. Cl.[2] G05B 1/00
U.S. Cl. 250—202 5 Claims

1. A photoelectric line follower for following a line on a surface disposed in a plane, comprising a body rotatable about a given axis and adapted to carry at one of its ends at least one source of light to shine light on said plane, said line intersecting the said axis externally of the body; scanning means; a photoelectric transducer; optical means secured to the body for collecting light reflected from the surface and directing it to the scanning means for causing the light to be oscillated across the face of said photoelectric transducer so that the optical axis of

the optical means is oscillated transversely to the line being followed; wherein the improvement consists in the provision of circuit means for altering the light output of the lamps to cause the transducer to produce a signal of chosen amplitude



and polarity when the said surface is wholly white, and bias-changing means for altering the electrical bias of the photoelectric transducer to cause it to produce a signal of the same amplitude but opposite polarity when that part of the said surface which intersects the optical axis is wholly black.

4,121,098

RADIATION ANALYSIS APPARATUS AND METHOD UTILIZING MULTI-CHANNEL PULSE PEAK VOLTAGE DISCRIMINATOR

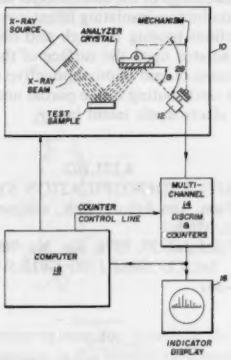
Emil Jagoutz, Mainz-Gonsenheim, and Christl Palme, Mainz, both of Germany, assignors to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V., Göttingen, Germany

Filed Mar. 29, 1977, Ser. No. 782,564

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1977, 2703562

Int. Cl.[2] G01N *23/20*; G21K *1/00*

U.S. Cl. 250—273 **10 Claims**



1. Apparatus for analysis of X-ray fluorescence, comprising, in combination:

means for causing a sample material to emit a beam of X-ray fluorescence;

a refraction crystal interposed in said beam for providing spectrometric angular dispersion of X-rays in a refracted beam in accordance with their wave length;

an angle-sensitive X-ray detector for detecting X-ray intensity with respect to wave length as represented by refraction angle in said beam and producing electric pulses at its output;

a multichannel peak voltage discriminator circuit having a plurality of channels each corresponding to a different range of pulse heights and having its input connected to the output of said detector for providing an output responsive to an input pulse only in that one of its multiplicity of output channels which corresponds to the voltage range in which the peak voltage of the input pulse lies, and

means connected to each output channel of said multichannel peak voltage discriminator for producing a signal representative of the number of pulses produced in said output channel.

4,121,099

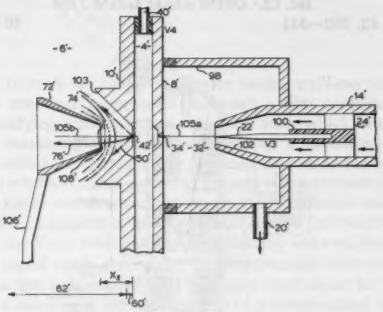
METHOD AND APPARATUS FOR FOCUSSING AND DECLUSTERING TRACE IONS

John Barry French; Neil M. Reid, both of Thornhill, and Janette A. Buckley, Willowdale, all of Canada, assignors to The Governing Council of the University of Toronto, Toronto, Canada

Continuation-in-part of Ser. No. 555,202, Mar. 3, 1975, Pat. No. 4,023,398. This application Apr. 25, 1977, Ser. No. 790,216

Int. Cl.[2] B01D *59/44*

U.S. Cl. 250—296 **17 Claims**



1. A method of focussing ions travelling from a gaseous region through a vacuum chamber to an analyzer in the vacuum chamber, said gaseous region being adjacent said vacuum chamber, said method comprising:

(a) admitting gas from said gaseous region into said vacuum chamber through an orifice in said chamber, said orifice communicating with said gaseous region,

(2) maintaining a vacuum in said chamber and maintaining said gas in said gaseous region at a higher pressure so that said gas passes through said orifice and expands from said orifice into said chamber generally in the form of a cone in said chamber and oriented about an axis extending through said orifice with its apex adjacent the orifice, said cone of expanding gas being termed a free jet, the number density in molecules per cubic centimeter of said gas in said free jet being high close to said orifice and falling rapidly with increasing distance from said orifice, the number density of said gas being relatively very low in a vacuum region in said chamber remote from said orifice and said analyzer being in said vacuum region,

(3) moving said ions through said orifice into said free jet in said chamber, the expanding gas in said free jet tending to cause said ions to diverge conically,

(4) focussing said ions to direct at least some of said ions along a path of travel extending from said orifice into said vacuum region toward said analyzer by applying an electric field to said ions in a selected region which is adjacent said orifice and in said free jet, said field being arranged to direct the paths of at least some of said ions along said path of travel, said selected region being close to said orifice so that the number density of said gas in said selected region is relatively high to limit the kinetic energy spread which ions in said selected region can acquire from accelerations imparted by said electric field,

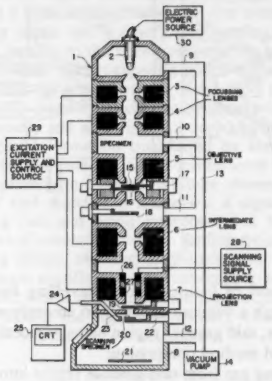
(5) and maintaining the region along said path of travel between said selected region and said vacuum region substantially free of all but weak electric fields, to limit the kinetic energy spread imparted to ions in their travel from said selected region to said analyzer.

4,121,100

ELECTRON MICROSCOPE

Morioki Kubozoe; Yoshihisa Minamikawa, both of Katsuta, and Shinjiro Katagiri, Mito, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 18, 1977, Ser. No. 788,538
Claims priority, application Japan, Apr. 21, 1976, 51-44490
Int. Cl.[2] G01M *23/00;* G21M *1/08*
U.S. Cl. 250—311 10 Claims



1. An electron microscope having means for generating an electron beam, a focussing lens system for focussing said electron beam on a predetermined first position, a magnification lens system including an objective lens and at least two additional magnification lenses and adapted for magnifying the focussed electron beam and projecting it on a screen, and means for holding a specimen to be electron-microscopically analyzed detachably at said first position, characterized by comprising:

means for detachably holding a specimen to be scanning-electron-microscopically analyzed at a second position disposed outside the lens field of one of said additional magnification lenses and at the side thereof close to said screen; means for operating said focussing and said magnification lens systems such that they may focus said generated electron beam on said specimen to be scanning-electron-microscopically analyzed; means for scanning said specimen to be scanning-electron-microscopically analyzed with said electron beam focussed thereon to thereby generate a signal inherent in said scanned specimen; and means for detecting said signal,

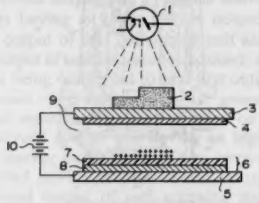
wherein one of said magnification lenses nearest to said second position at the side of said objective lens has an upper and a lower magnetic poles and an excitation coil for forming said lens field between said magnitic poles, said lower magnetic pole being made to have substantially flattened plate-like form.

4,121,101

METHOD OF RECORDING RADIOGRAPHIC IMAGES

Seije Matsumoto, Minami-ashigara; Isoji Takahashi, Asaka; Takao Komaki; Masamitsu Ishida, both of Minamiashigara; Tomotaka Kozeki, Tokyo; Kazuo Horikawa, and Kozi Shimanuki, both of Asaka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 22, 1976, Ser. No. 744,119
Claims priority, application Japan, Nov. 21, 1975, 50-139960; Nov. 21, 1975, 50-139961
U.S. Cl. 250—315 A 9 Claims



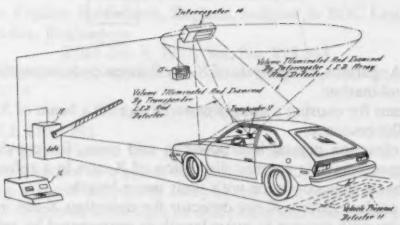
1. A method of recording a radiographic image on a recording material wherein radiations are irradiated through an object the image of which is to be recorded, the radiations being capable of causing a material to emit secondary electrons or ionize a fluid in a gas or liquid where the radiations passing through the object are further irradiated upon a substance which emits charged particles upon receipt of the radiations, the amount of the charged particles emitted thereby being large where the dose of radiations received thereby is large, an insulating latent image recording layer is located being faced to said substance, and an electric field is applied across a space where said charged particles are emitted and said insulating latent image recording layer for collecting said charged particles on the surface of the recording layer to form an electrostatic latent image in a pattern representing a radiographic image of said object, wherein the improvement comprising making said insulating latent image recording layer of a photoconductive insulating material responsive to said radiations and attaching said layer on a conductive substrate, and partly neutralizing the charge of the electrostatic latent image formed on the photoconductive insulating latent image recording layer with the radiations passing through said object and said substance and irradiated upon the surface of the recording layer, the responsiveness of said photoconductive insulating layer to said radiations contributing to the partial neutralization of said charge of the electrostatic latent image.

4,121,102

OBJECT IDENTIFICATION SYSTEM

Stephen S. Wilson, Ann Arbor, Mich., assignor to Kilo Corporation, Detroit, Mich.

Filed Jul. 27, 1976, Ser. No. 709,237
Int. Cl.[2] G01J *1/00;* G01S *9/56*
U.S. Cl. 250—341 145 Claims



1. A system for remotely identifying an object including a transponder associated with the object to be identified and containing information identifying said object and an interro-

gator for determining the identification of said object, the improvement wherein:

said interrogator is operative to transmit an interrogator signal having a predetermined clock frequency and to detect signals from said transponder representative of said identifying information; and

said transponder includes resonating means adapted to resonate at said clock frequency and to provide an output signal which at least initially increases in amplitude as pulses are repetitively received at said clock frequency, said resonating means being relatively non-responsive to pulses at frequencies other than said clock frequency, said transponder also including threshold means being responsive to a predetermined amplitude of said resonating means output signal attained only after a plurality of said repetitive pulses at said clock frequency are received by said resonating means to cause said transponder to transmit at said clock frequency in response to the receipt of said interrogator signal a sequence of transponder pulses representing in signal form said identifying information.

2. The object identification system of claim 1 wherein said interrogator includes infrared transmitting means for transmitting an infrared interrogator signal, and said transponder includes infrared detecting means for receiving said infrared interrogator pulses.

4,121,103

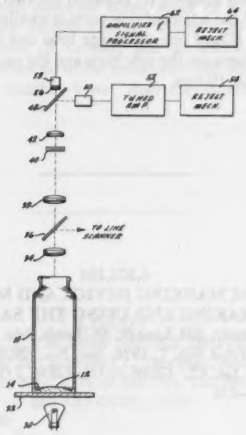
CAUSTIC DETECTION SYSTEM

Fredrick L. Calhoun, Rolling Hills, Calif., assignor to Industrial Dynamics Company, Ltd., Torrance, Calif.

Filed Nov. 5, 1976, Ser. No. 739,059

Int. Cl.[2] G01N *21/24, 21/34*

U.S. Cl. 250—343 **30 Claims**



1. An inspection system for detecting the presence of an aqueous base solution in the bottom of a container, including,

means disposed relative to the container for directing energy including at least energy in the infrared region through the bottom of the container and along the central axis of the container, and

means disposed relative to the container for detecting the energy of particular infrared wavelengths passing from the bottom of the container and for producing signals in accordance with such detection and with the presence of an aqueous base solution providing for the absorption of the energy at the particular infrared wavelengths and with the absence of an aqueous base solution allowing for the passage of the energy at the particular infrared wavelengths.

4,121,104

X-RAY EXAMINING DEVICE WITH AUTOMATIC TIMER AND FILM CONTAINER FOR AN X-RAY EXAMINING DEVICE

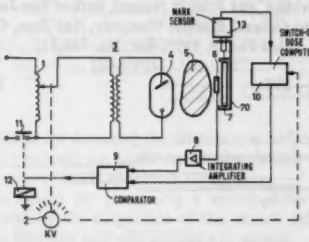
Detlev Richter, Norderstedt, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 16, 1976, Ser. No. 751,473

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1975, 2556699

Int. Cl.[2] G01J *1/42*

U.S. Cl. 250—355 **10 Claims**



1. In an X-ray examining device having an X-ray source, a film container support for receiving a film container with intensifying screens and an automatic timer which comprises

a measuring device for determining a measuring signal which corresponds to a radiation dose to be measured,

a switch-off signal computer for generating a switch-off dose signal which corresponds to a preset radiation dose,

and a comparator and switch-off device for switching-off the X-ray source when the measuring and switch-off dose signal are in agreement; the improvement wherein:

the film container support includes a mark sensor for sensing a mark on a film container to be accommodated into the film container support; and

an output of the mark sensor is connected to an input of the switch-off signal computer to provide a switch-off dose signal which is tuned to a preset high voltage and matched to an intensifying screen in said film container.

4,121,105

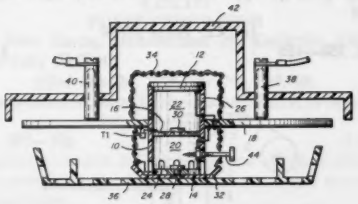
IONIZATION DETECTOR

Elias E. Solomon, Duxbury, Mass., assignor to The Gamewell Corporation, Medway, Mass.

Continuation-in-part of Ser. No. 593,704, Jul. 7, 1975, Pat. No. 4,021,671. This application Nov. 8, 1976, Ser. No. 739,455

Int. Cl.[2] G01T *1/18*

U.S. Cl. 250—381 **23 Claims**



1. An ionization detector comprising;

a chamber structure including means defining a first chamber, means defining a second chamber having means for receiving gases from external of the second chamber, and common boundary means between chambers including a common electrode,

one electrode associated with said second chamber,

another electrode within the first chamber defining a third chamber within the first chamber and being at least partially open to provide an ionization path between the first and third chambers,

means including a radioactive source disposed in at least the second chamber for establishing an ionization current in the chamber structure,

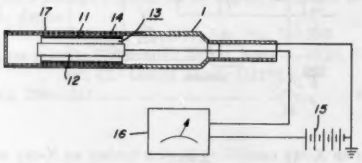
and means coupled from at least the common electrode for detecting changes in the ionization current.

4,121,106

SHIELDED REGENERATIVE NEUTRON DETECTOR

James H. Terhune, and John P. Neissel, both of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Feb. 8, 1977, Ser. No. 766,717
Int. Cl.[2] G01T *3/00*
U.S. Cl. 250—390 14 Claims



1. A neutron detector comprising:

a sealed chamber having two spaced electrodes positioned therein;

an ionizable gas disposed within the space between said electrodes;

a layer of a mixture of an active material and a breeding material positioned within said chamber, said active material and said breeding material being U-235 and U-234, respectively; and

a portion of said detector being formed of a shielding material positioned to decrease the neutron flux to which the active material and the breeding material are subjected,

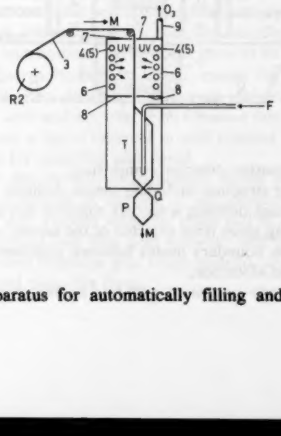
said breeding and shielding materials having substantially matching neutron capture cross-section curves, whereby their individual effects on detector life are mutually enhanced.

4,121,107

APPARATUS FOR AUTOMATIC LOW-BACTERIA TO ASEPTIC FILLING AND PACKING OF FOODSTUFFS

Robert Bachmann, Dottingen, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Division of Ser. No. 557,259, Mar. 11, 1975, abandoned. This application Apr. 18, 1977, Ser. No. 788,343
Claims priority, application Switzerland, Apr. 10, 1974, 5050/74
Int. Cl.[2] H01J *37/00*
U.S. Cl. 250—455 5 Claims



1. An apparatus for automatically filling and packaging foodstuffs under aseptic to low-bacterial count conditions, said foodstuffs having been previously disinfected or sterilized, comprising:

at least two mercury discharge tubes having a high-current, low-pressure mercury discharge with a current density of more than 1 A/cm^2 and a mercury pressure of 5×10^{-3} to 5×10^{-1} Torr, the discharge tubes having discharge paths, the material surrounding the discharge paths within the discharge tubes being transparent at least for the wavelength 253.7 nm;

means for passing a packaging material to a station for receiving said foodstuffs;

means for applying the spectral radiation intensity of the 253.7 nm line of the ultraviolet radiation of the discharge tubes on the packaging material with at least 0.05 W/cm^2, the discharge tubes being arranged one behind the other relative to the direction (M) of movement of said packaging material toward said station and extending across the entire width of said packaging material, said discharge paths of said discharge tubes lying in a plane (E) parallel to the plane of the irradiated portion of said packaging material,

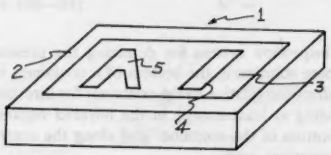
said radiation applying means including a reflector formed of an upper part disposed above and parallel to the plane of said discharge paths, and two side parts extending from said upper part to a line of said packaging material at those points at which said ultraviolet radiation begins and ends, respectively, the reflectivity of the reflector being better than 0.75 and said two side parts being approximately perpendicular to said upper part, wherein the ratio of the vertical distance (*a*) between the plane (E) of the discharge paths and the packaging material to the distance (*d*) between two adjacent discharge paths is at least 0.5, the shortest distance (*e*) between the two outer discharge paths and the adjacent side parts is smaller than twice the diameter (D) of one discharge tube and the shortest distance (*f*) between the side parts and the packaging material is less than 10 mm.

4,121,108

X-RAY FILM MARKING DEVICE AND METHODS OF MAKING AND USING THE SAME

George H. Manor, 324 Lanark, St. Louis, Mo. 63137

Filed Sep. 7, 1976, Ser. No. 720,669
Int. Cl.[2] G03B *41/16*; G03C *5/16*
U.S. Cl. 250—476 12 Claims



1. An x-ray marking device comprising,

frame means,

indicia means operably disposed within the boundaries of said frame means, said indicia being discrete from said frame means, wherein said indicia extends substantially the full depth of said device,

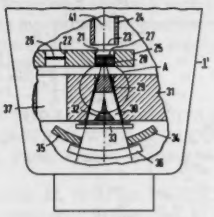
suspension means disposed between said frame and indicia.

4,121,109

ELECTRON ACCELERATOR WITH A TARGET EXPOSED TO THE ELECTRON BEAM

Leonhard Taumann, Lafayette, Calif., and Rudolf Schittenhelm, Erlangen, Germany, assignors to Applied Radiation Corporation, Walnut Creek, Calif.

Filed Apr. 13, 1977, Ser. No. 787,275
Int. Cl.[2] H05G 3/00
U.S. Cl. 250—505 10 Claims



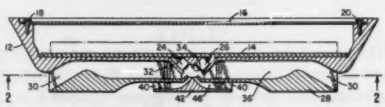
1. An electron accelerator comprising:
(a) an electron beam;
(b) a target means exposed to the electron beam for the production of x-ray deceleration radiation in a beam cone;
(c) a collimator behind the target in the direction of the beam, said collimator having a fixed dimension passageway sufficient for a beam cone adjusted to maximum dimensions;
(d) adjustable x-ray aperture plates behind the collimator in the direction of the beam; and
(e) an electron absorber behind the target in the direction of the beam, said absorber being made of a material of a relatively low atomic number which is lower than the atomic number of copper, and an additional electron absorber positioned in the collimator and made of a material atomic number lower than the atomic number of copper.

4,121,110

OPTICALLY BIASED SMOKE DETECTOR

Elias E. Solomon, 20 Christina Ct., Duxbury, Mass. 02332

Filed Nov. 4, 1976, Ser. No. 738,750
Int. Cl.[2] G01N 21/26
U.S. Cl. 340—630 19 Claims



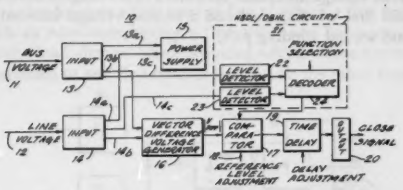
1. In an optical smoke detector wherein the presence of smoke modifies the reception by a transducer of light from a source to trigger an alarm, a system for optically biasing said transducer comprising means for determining the field of view of said transducer and for causing a controlled and determinable amount of light emanating from said source to reach said field of view of said transducer directly from said source, said means for determining including means for adjustably controlling the direct light between source and transducer.

4,121,111

APPARATUS FOR DETECTION OF SYNCHRONISM BY MEANS OF VECTOR DIFFERENCE MEASUREMENT

George A. Crisafulli, Hatfield, Pa., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Oct. 18, 1976, Ser. No. 733,440
Int. Cl.[2] H02J 3/00
U.S. Cl. 307—87 10 Claims



1. Apparatus for detecting the relative synchronism between a first and a second a.c. signal occurring on first and second lines, respectively, said apparatus comprising:
(A) first means for generating a vector difference signal representing the magnitude of the vector difference between said first and said second a.c. signals;
(B) second means for monitoring the instantaneous magnitudes of said first and second a.c. signals and for determining when first and second conditions exist:
(1) said first condition being defined as that condition wherein said first a.c. signal has an instantaneous magnitude which is greater than a first predetermined value and said second a.c. signal has an instantaneous magnitude which is less than a second predetermined value;
(2) said second condition being defined as that condition wherein said first a.c. signal has an instantaneous value which is less than said first predetermined value and said second a.c. signal has an instantaneous value greater than said second predetermined value;
(c) switch means responsive to said second means and selectively operable in first, second and third states, said switch means to generate an enabling signal:
(1) when said first condition exists and said switch means is in said first state;
(2) when said second condition exists and said switch means is in said second state;
(3) when either said first or said second conditions exist and said switch means is in said third state;
(D) third means for enabling a desired interconnection between said first and said second lines if either said vector difference signal is less than a predetermined value for a predetermined time period or said switch means generates said enabling signal for said predetermined time period.

4,121,112

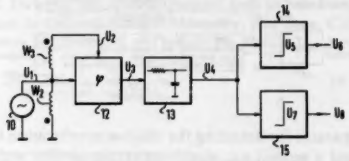
PULSE GENERATOR

Gunter Fritz Hartig, Hansastrasse 29, Karlsruhe, Fed. Rep. of Germany (D-7500)

Filed Jun. 24, 1976, Ser. No. 699,488
Claims priority, application Switzerland, Jul. 2, 1975, 8604/75
Int. Cl.[2] H02P 9/00
U.S. Cl. 307—106 8 Claims

1. A pulse generator for the generation of pulses which are synchronously associated with the movement of a mechanical part, comprising:
an element provided with teeth;
a pick-up head having an exciting winding for generating a field, said teeth running past said pick-up head and modulating said field;
means for providing a carrier frequency voltage for exciting said exciting winding;
said pick-up head further including a measuring winding in which said field modulated by said teeth induces a measuring voltage;

circuit means responsive to said measuring voltage for converting said measuring voltage into a pulse sequence, said circuit means including a phase discriminator into which said measuring voltage and said exciting voltage are supplied, said measuring winding including first and second winding parts, one of which being connected in a direction opposite to the other such that said measuring voltage is the voltage difference between a first voltage induced in said first winding part and a second voltage induced in said second winding part;



said second winding part being arranged such that said second voltage compensates a basic voltage component of said first voltage which is in phase with said exciting voltage, so that the measuring winding provides a total measuring voltage having a relatively large phase shift with respect to said exciting voltage dependent upon instantaneously located material adjacent said pick-up head;

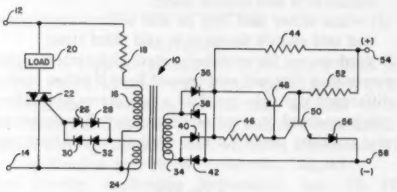
and wherein said exciting winding and said measuring winding are arranged concentrically in relation to one another on a bell shaped core.

4,121,113

ELECTRIC SWITCH

Robert Edward White, Aloha, and David Edward Moeckli, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 11, 1977, Ser. No. 786,000
Int. Cl.[2] H01H 9/54
U.S. Cl. 307—140 **3 Claims**



1. A remotely activated electrical control circuit for applying power to a load, the circuit comprising:

switch means connected to an alternating current power supply and in series with the load for switching power to the load;

control means for controlling the conduction and non-conduction of said switch means, said control means being isolatively coupled to said alternating current power supply and said switch means;

said control means includes a transformer with a first winding for applying a control voltage to said switch means for turning it on and off and also includes a control section for selectively shorting a second winding of said transformer; and

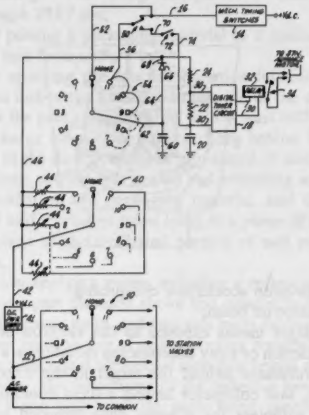
said control section includes a full-wave rectifier connected between the output terminals of said second winding of said transformer for providing a DC voltage to activate said control means.

4,121,114

STATION TIMING SELECTION CIRCUIT FOR IRRIGATION CONTROLLER

Richard L. Ruggles, Mount Baldy, Calif., assignor to Clemar Manufacturing Corporation, Azusa, Calif.

Filed Dec. 10, 1976, Ser. No. 749,386
Int. Cl.[2] H01H 7/00
U.S. Cl. 307—141 **8 Claims**



1. In an irrigation control system having a plurality of irrigation stations which are actuated sequentially in a scheduled irrigation cycle, station timing means for timing the irrigation at each station, and a timing capacitor and timing resistor, both associated with said station timing means, the improvement comprising:

an additional capacitor connectable in parallel with said timing capacitor; and

means for connecting said additional capacitor in parallel with said timing capacitor for selected ones of said plurality of irrigation stations;

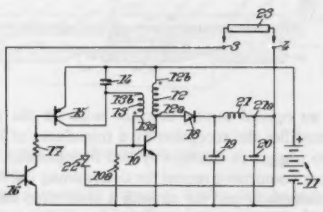
whereby said means for connecting said additional capacitor provides for operation of selected ones of said plurality of irrigation stations for relatively long station times.

4,121,115

D. C. POWER PACKS, INTER ALIA OF THE DISPOSABLE KING, FOR PROVIDING A PREDETERMINED RATED VOLTAGE

Henri Courier de Mére, Paris, France, assignor to Bicosa Societe de Recherches, France

Filed Dec. 15, 1976, Ser. No. 750,648
Claims priority, application France, Dec. 18, 1975, 75 38878
Int. Cl.[2] H02J 7/00
U.S. Cl. 307—150 **13 Claims**



1. A power pack for a d.c. energized device, adapted to provide a predetermined d.c. voltage, said power pack having

a casing of a given external shape and dimension, and supporting two output terminals located in predetermined positions, said casing including therein at least one d.c. power supply, such as a cell, adapted to output an on-load d.c. voltage lower than the said predetermined d.c. voltage and a low-consumption converter circuit for converting a signal from the d.c. power supply into a d.c. voltage signal of the predetermined value, the signal from the converter circuit being applied across the said output terminals, and control electrode type switching means, said switching means connected between one of said outpt terminals and said d.c. power supply and controlled by a load across said terminals such that in a no-load state said switching means inhibits operation of said converter circuit and the drain on the d.c. power supply.

4,121,116

COMPONENT FOR LOGIC CIRCUITS AND LOGIC CIRCUITS EQUIPPED WITH THIS COMPONENT

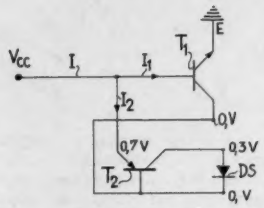
Pham Ngu Tung, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 22, 1977, Ser. No. 770,309

Claims priority, application France, Feb. 27, 1976, 76 05585

Int. Cl.[2] H03K *19/08*

U.S. Cl. 307—213 **3 Claims**



1. A solid state component for logic circuit comprising integrated upon one and the same substrate, in combination, a first, a second, a third and a fourth semiconductive layer forming three rectifying junctions, and a first and a second complementary transistor having respective emitters, bases and collectors, said first layer being the emitter of said first transistor, said second layer, the base of said first transistor and the emitter of said second transistor, the third layer being the collector of said first transistor and the base of said second transistor, the fourth layer being the collector of said second transistor, said first layer being connected to ground, said second layer being adapted for connection to a constant d.c. current source, a rectifying element connected in parallel with said third and said fourth layers, said third layer being connected to ground when said first transistor is conductive, and the voltage drop across said rectifying element when unblocked being predetermined and lower than the voltage drop across said third and fourth layer when the junction formed therebetween is unblocked.

4,121,117

REGENERATOR CIRCUIT FOR CCD ARRANGEMENTS

Kurt Hoffmann, Taufkirchen, and Gottfried Wotruba, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

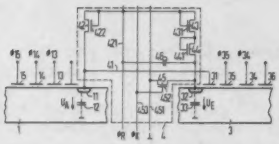
Filed Sep. 2, 1976, Ser. No. 720,050

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1975, 2541662

Int. Cl.[2] H01L *27/10, 29/78*; G11C *19/28*

U.S. Cl. 307—221 D **23 Claims**

1. Regenerator circuit for CCD arrangements for connecting a first CCD arrangement having an output diffusion zone to a second CCD arrangement, said output diffusion zone having a capacitance to ground during operation, said second CCD arrangement having an input diffusion zone, said input diffusion zone having a capacitance to ground during operation, a first input transistor being formed by said input diffusion zone, a gate electrode adjacent said input diffusion zone and a potential well which lies below the next adjacent electrode of said second CCD arrangement, said output diffusion zone being connected via a connection line to said gate electrode of said input transistor, and having a first load element which on the one hand is connected to said output diffusion zone and on the other hand to a first control line to which a first potential with an amplitude having a first value can be connected, a second load element being provided which on the one hand is connected to said first control line and on the other hand to a



third load element, said third load element being connected on the one hand to said second load element and on the other hand to said input diffusion zone of said second CCD arrangement, a capacitor coupling said first control line to said input diffusion zone of said second CCD arrangement, a second transistor being connected on the one hand to said input diffusion zone and on the other hand to a second control line to which ground potential can be connected, and the gate terminal of said second transistor being connected to a third control line to which a second potential having a second value can be connected, the capacitance of the coupling capacitor being determined in accordance with the formula:

$$C_{46} = \frac{\sigma_U \cdot C_{33}}{U_R - \sigma_U} = \frac{\frac{\Delta U_A}{2} \cdot C_{33}}{U_R - \frac{\Delta U_A}{2}}$$

where:

C_{46} is the value of said coupling capacitor;

C_{33} is the capacitance between the input diffusion zone and ground;

U_R is the amplitude of the voltage pulses in said first control line;

U_A is the value of the charges stored by the capacitance formed between the output diffusion zone and ground;

ΔU_A is the value of the charge arriving at said output diffusion zone divided by the output capacitance formed between the output diffusion zone and ground; and

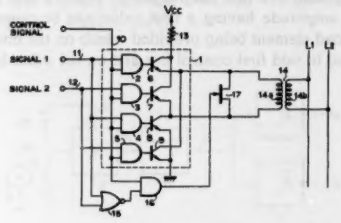
δ_U is ΔU_A divided by 2, which arises when a charge is transmitted to the output diffusion zone.

4,121,118

BIPOLAR SIGNAL GENERATING APPARATUS

Seiichi Miyazaki, Wakou, Japan, assignor to Ohkura Electric Co., Ltd., Tokyo, Japan

Filed Jul. 6, 1977, Ser. No. 813,241
Claims priority, application Japan, Jul. 7, 1976, 51-90155
Int. Cl.[2] H03K *5/20, 13/24*
U.S. Cl. 307—262 **4 Claims**



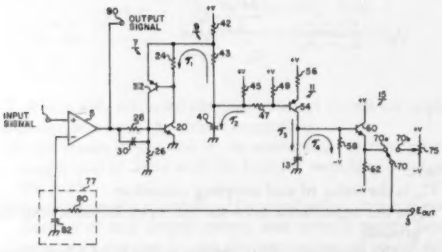
1. In an apparatus for generating a bipolar signal from two kinds of signals which are related such that at a period of time at which one of said two signals has an "H" level the other signal has an "L" level, said bipolar signal having a positive level at a period of time at which said first signal has said "H" level having a negative level at a period of time at which said second signal has said "H" level and having a level of its neutral region at a period of time at which both said first and second signals have said "L" levels, respectively, the improvement comprising a transformer having a primary winding and a secondary winding, a first switch means for supplying a current to said primary winding flowing therethrough in one direction when said first signal has said "H" level, a second switch means for supplying a current to said primary winding flowing therethrough in a direction opposite to said direction and a third switch means for connecting two terminals of said primary winding with each other when both said first and second signals have said "L" levels, respectively.

4,121,119

PULSE PEAK DETECTOR

Gordon Wallace Meigs, and Wayne Donald Thomas, both of Beaverton, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Feb. 16, 1977, Ser. No. 769,074
Int. Cl.[2] H03K *5/00*
U.S. Cl. 307—351 **2 Claims**



1. A peak detector for producing a D.C. voltage proportional to the peak amplitude of an input signal, said peak detector including an input signal path, a storage element for storing a peak voltage value and providing a D.C. voltage output therefrom, and a comparator for generating an error signal when the amplitude of the input signal exceeds the output voltage, wherein the improvement comprises:

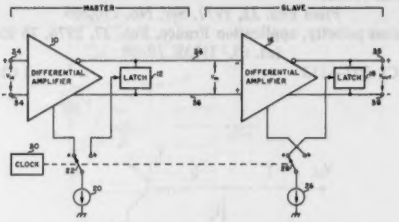
control circuit means for controlling the voltage to which said storage element charges, said control circuit means including a current source coupled to said storage element, a resettable timing circuit coupled to said current source for turning said current source on for at least a predetermined time period to provide current to charge said storage element, and latch means responsive to said error signal for resetting said timing circuit and thereby turning said current source on, said latch means comprising a pair of oppositely-poled transistors connected in a regenerative relationship.

4,121,120

CLOCK DRIVEN VOLTAGE COMPARATOR EMPLOYING MASTER-SLAVE CONFIGURATION

Steven E. Wetterling, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed May 5, 1977, Ser. No. 793,980
Int. Cl.[2] G11C *7/06*
U.S. Cl. 307—352 **11 Claims**



1. A clock-driven voltage comparator, comprising:

comparator means for receiving an input signal and periodically determining therefrom logic states, said comparator means comprising a first emitter-coupled pair of transistors the bases of which are adapted to receive said input signal;

amplifier means couped to said comparator means for amplifying said logic states, said amplifier means comprising a second emitter-coupled pair of transisors the bases of which are coupled to the collectors of said first pair of transistors; and

first and second latch means operatively coupled to said comparator means and said amplifier means respectively for holding said logic states until new logic states are determined, said first latch means comprising a third emitter-coupled pair of transistors the collectors of which are cross coupled to the collectors of said first pair of transistors, and said second latch means comprises a fourth emitter-coupled pair of transistors the collectors of which are cross coupled to the collectors of said second pair of transistors.

4,121,121

FOLLOWER RESPONSE CONTROL CIRCUIT

Stephen Chester Gabeler, Sudbury, Mass., assignor to Computer Identics Corporation, Westwood, Mass.

Filed Sep. 13, 1977, Ser. No. 832,934
Int. Cl.[2] H03K *5/01, 5/08*
U.S. Cl. 307—358 **8 Claims**

1. A follower response control circuit for a system for reading binary coded information and providing a reader signal with positive levels representing the first binary state and negative levels representing the second binary state, and having a positive peak follower circuit and a negative peak follower circuit, each of which includes means for defining a pre-established time constant for producing, respectively, a positive peak signal and a negative peak signal in response to the reader signal, comprising:

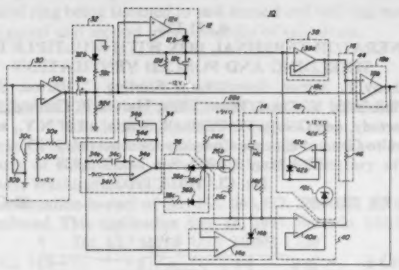
means for defining a second time constant for one of said peak follower circuits;

switching means for selectively switching said means for

defining a second time constant in and out of said one of said peak follower circuits;

a direction detector circuit for determining whether the reader signal level is moving toward the polarity of the peaks followed by said one of said peak follower circuits;

a level detector circuit for determining whether the reader signal level is in the one of said states represented by the polarity of the peaks which said one of said peak follower circuit follows; and



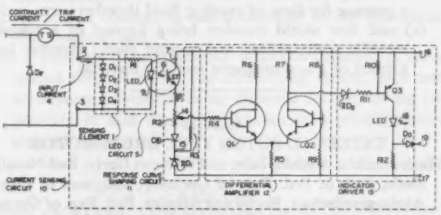
a switch control circuit responsive to said detector circuits for operating said switching means to introduce said means for defining a second time constant into said one of said peak follower circuits to alter temporarily the pre-established time constant of that peak follower circuit during the period when the reader signal level is moving toward and is in the one of said states represented by the polarity of the peaks followed by said one of said follower circuits.

4,121,122

CURRENT SENSING CIRCUITRY

Kurt Pokrandt, 101-1406 Laburnum St., Vancouver, British Columbia V6J 3W3, Canada

Filed Dec. 22, 1976, Ser. No. 753,368
Int. Cl.[2] H03K *5/153, 5/20*
U.S. Cl. 307—362 **5 Claims**



1. A current sensing circuit arrangement, comprising:

(a) a plurality of series connected diodes providing a first D.C. current path from a first point to a second point so that current flows in the forward direction through each of said diodes when a positive voltage is applied to said first point relative to said second point;

(b) a light emitting diode circuit connected in parallel with said series connected diodes for producing light energy dependent on the voltage across said current sensing element when current flows in said first path from said first point to said second point;

(c) a light sensitive transistor electrically isolated from said light emitting diode circuit and positioned to receive said light energy produced, said light sensitive transistor having a base for receiving said light energy, an emitter and a collector;

(d) an output control circuit, comprising:

(i) a control circuit input operatively connected to said light sensitive transistor;

(ii) a control circuit output;

(iii) a high input impedance, high gain amplifier having an amplifier input and an amplifier output, said amplifier output operatively connected to said control circuit output;

(iv) voltage reference means for providing a fixed voltage reference at a voltage reference point;

(v) first resistance means connected between said control circuit input and said amplifier input;

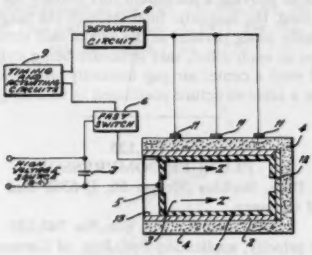
(vi) second resistance means and a blocking diode connected in series between said amplifier input and said voltage reference point.

4,121,123

EXPLOSIVELY DRIVEN PLASMA CURRENT GENERATOR

Richard L. Crolius, Rancho Palos Verdes, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 17, 1977, Ser. No. 778,761
Int. Cl.[2] H02N *4/00*
U.S. Cl. 310—10 **2 Claims**



1. An explosively driven plasma current generator comprising

a cylindrical member of conductive material,

means for generating a magnetic field within said cylindrical member,

an end plate of conductive material connected to effect electrically and hermetically tight closure of one end of said cylindrical member,

a partial end plate disposed within and spaced from the distal end of said cylindrical member effecting electrically tight closure thereof,

insulating means disposed on the inner surface of said cylindrical member and in combination with said partial end plate effecting hermetically tight closure of the distal end of said cylindrical member,

gas plasma disposed within said cylindrical member,

explosive means disposed around the outer peripheral surface of said cylindrical member, and

means for detonating said explosive means.

4,121,124

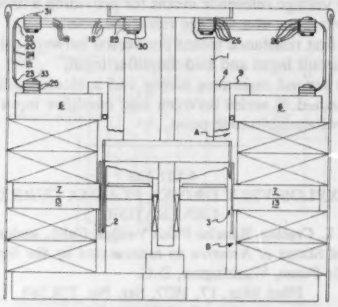
ELECTRODYNAMIC FORCE GENERATOR

Frederick C. Hunt, 10246 Clipper Cove, Aurora, Ohio 44202

Filed Jul. 26, 1976, Ser. No. 709,008
Int. Cl.[2] H02H *33/02*
U.S. Cl. 310—13 **4 Claims**

1. A center gap permanent magnet electrodynamic force generator comprising upper and bottom annular permanent magnet sections, the upper section comprising a top plate, an outer pole plate, a center pole and at least one ring magnet interposed between the top plate and the outer pole plate, the bottom section comprising a bottom plate, a center pole, an outer pole plate and at least one ring magnet interposed be-

tween the bottom plate and the outer pole plate, said sections being separately magnetized as a sub-assembly prior to the assembly thereof in the complete generator, said sub-assemblies being assembled as a unitary generator structure on a single axis with the outer pole plate of each said sub-assembly abutting each other to form a split center plate for said structure so as to provide a maximum flux density for the magnet material used, the magnetic field through the magnets of each sub-assembly being parallel to the axis of said structure and in opposition to each other, said structure being cylindrical and provided with a center air gap inwardly adjacent said center plate, and a table structure positioned in said air gap.



4,121,125
PLUNGER COMPRESSOR

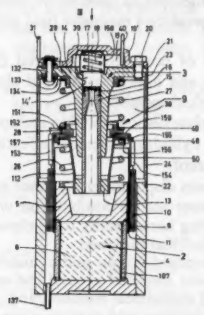
Heinrich Dölz, Berliner Strasse 66, D-6368 Bad Vilbel, Fed. Rep. of Germany

Filed Dec. 8, 1976, Ser. No. 748,530

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 2558667

Int. Cl.[2] H02K *33/18*

U.S. Cl. 310—27 **12 Claims**



1. An oscillatory electrodynamic compressor comprising a sealed housing having a fluid inlet and a fluid outlet and having located within said housing a permanent magnet formed by a pair of radially spaced pole shoes, a cylindrical electrically excitable coil axially movable between said pole shoes, a cylinder member arranged in tandem axially with said magnet having a longitudinally extending compression bore, a plunger reciprocable within said bore having an end extending outwardly toward said coil, means fixedly connecting said coil and said plunger for conjoint movement so that on excitation of said coil said plunger is caused to compress fluid within said bore, said plunger having fluid inlet valve communicating with said housing inlet and said bore having fluid discharge valve means operable upon the compression of fluid within said bore in communication with the housing outlet, said coil and connected plunger being resiliently supported by a pair of opposed springs, one of which bears against said connection means on the magnet side thereof and the other bears against said connection means on the compression side thereof, said connection means and said springs being formed so that in the absence of excitation of said coil the planes defined by the bearing of the springs against the connection means intersect the axis of the plunger within the length of the cylinder bore.

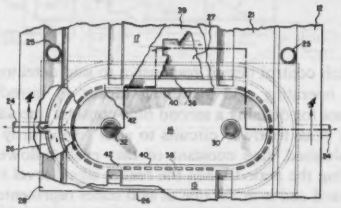
4,121,126
GENERATOR TERMINAL BOX WITH MULTIPLE FLUX SHIELDING AND FORCED VENTILATION

Anthony F. Armor, Schenectady; Sterling C. Barton, Scotia; Madabushi V. Chari, Burnt Hills; Harold E. Collings, Schenectady, and George W. Turnbull, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 9, 1977, Ser. No. 775,923

Int. Cl.[2] H02K *9/00*

U.S. Cl. 310—59 **10 Claims**



1. In a terminal box for a dynamoelectric machine having a high voltage bushing passing therethrough and having a wall subject to heating from stray leakage flux from said bushing, a flux shield structure comprising:

(a) a first shield member spaced from said wall and providing a passage between said first shield member and said wall for flow of cooling fluid;

(b) a second shield member interposed between said first shield member and said bushing, said second shield member being spaced from said first shield member to provide a passage for flow of cooling fluid therebetween; and

(c) said first shield member being formed of a magnetic metallic material and said second shield member being formed of a non-magnetic metallic material.

4,121,127
EXTERNAL-ROTOR TYPE DRUM MOTOR

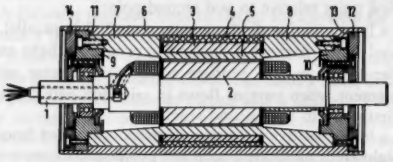
Hans-Joachim Adelski, Salz, and Wilhelm Gertz, Bad-Neustadt, Saale, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 15, 1977, Ser. No. 768,830

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1976, 2612537

Int. Cl.[2] H02K *7/00*

U.S. Cl. 310—67 R **1 Claim**



1. An external-rotor type drum motor comprising:

a rotor having first and second portions extending axially in

opposite directions, said first and second portions forming parts of the shorting ring of said rotor;

first and second end bells fastened to the ends of said first and second portions, respectively;

a drum cylinder serving as the return yoke for said rotor, said drum cylinder surrounding said rotor and end bells and having first and second inner shoulders at its ends adjacent said first and second end bells, respectively, said first inner shoulder resting against said first end bell;

a ring for securing said drum cylinder in the axial direction, said ring being fastened to said second end bell and resting against said second inner shoulder of said drum.

4,121,128

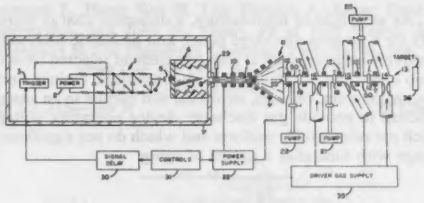
COLLECTIVE ION ACCELERATOR WITH FOIL-LESS BEAM EXTRACTION WINDOW

Thomas G. Roberts, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 668,877, Mar. 22, 1976, abandoned. This application Aug. 15, 1977, Ser. No. 824,673

Int. Cl.[2] H01J *7/16*; H05H *1/00*

U.S. Cl. 313—7 **5 Claims**



1. In an ion beam generating system including an evacuated ion accelerator and an ion extraction window spaced downstream therefrom, the improvement comprising:

(a) means for generating electrons for flow through said accelerator;

(b) means for injecting ions into said electron flow in said ion accelerator;

(c) means for connecting said accelerator to said ion extraction window; and

(d) a plurality of aerodynamic windows disposed in serial spaced relation along said connecting means, each said aerodynamic window being disposed for decreasing the pressure in said connecting means in a predetermined stepped relation.

4,121,129

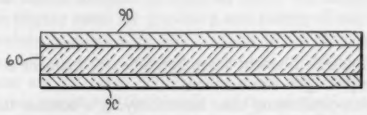
DISPLAY PANEL AND METHOD OF MANUFACTURE THEREOF

Thomas C. Maloney, Bernardsville, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 24, 1977, Ser. No. 800,048

Int. Cl.[2] H01J *61/30*

U.S. Cl. 313—221 **2 Claims**



1. A display panel including

a gas-filled envelope having a base plate and a face plate hermetically sealed together, said face plate having a viewing window,

a plurality of parallel cathode strips disposed generally vertically on the top surface of said base plate,

a plurality of horizontal anode strips on the inner surface of said face plate, said anode strips overlying said cathode strips, each crossing of an anode strip and a cathode strip defining a glow discharge cell, and

an insulating plate having a bottom surface and a top surface and a plurality of parallel channels therein, said plate being seated on said base plate so that said channels define rows of elemental cathode portions of said cathode strips, each channel being aligned with an anode strip, each row of elemental cathode portions being aligned with an anode strip and operable therewith, cathode glow being visible to a viewer through an anode strip and a channel,

said insulating plate being coated, on said top and bottom surfaces and on the walls of said channels, with an opaque material so that cathode glow cannot be seen by a viewer other than when viewed directly through an anode and a channel in said insulating plate.

4,121,130

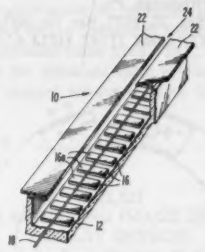
CATHODE STRUCTURE AND METHOD OF OPERATING THE SAME

Robert Allen Gange, Belle Mead, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 737,098, Oct. 29, 1976, abandoned. This application Apr. 4, 1977, Ser. No. 784,365

Int. Cl.[2] H01J *1/46, 21/10*

U.S. Cl. 313—302 **26 Claims**



1. A cathode structure, which comprises:

an insulating substrate having a plurality of discrete electrode pads on a surface thereof;

a thermionic cathode positioned to one side of said surface, said cathode extending across a surface of each one of said electrode pads in spaced relation therewith such that separate portions of said cathode are associated with different ones of said electrode pads; and

an apertured electrode positioned in spaced relation to said cathode and said electrode pads.

4,121,131

COLOR TELEVISION DISPLAY TUBE AND METHOD OF MANUFACTURING SAME

Johannes van Esdonk, and Petrus Franciscus Antonius Haans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 6, 1977, Ser. No. 757,347

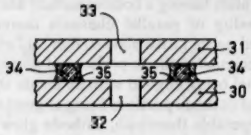
Claims priority, application Netherlands, Jan. 16, 1976, 7600422

Int. Cl.[2] H01J *29/07, 9/02*

U.S. Cl. 313—402 **13 Claims**

1. An article of manufacture comprising first and second apertured metal sheets defining first and second electrodes, respectively, of a color selection electrode system for a color display tube and insulating means for maintaining said sheets in substantially congruent relationship with each other with the apertures in said first sheet being aligned in a predetermined

relationship with the apertures in the second sheet; said insulating means being disposed between solid areas of said sheets and comprising a solid insulating core surrounded by an outer jacket, said jacket having a softening temperature lower than the softening temperature of said core so that upon heating the



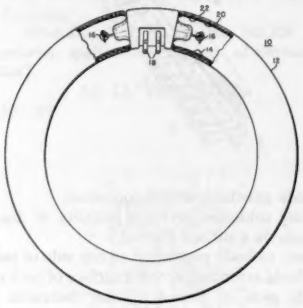
assembly formed by said sheets and said insulating means to a temperature at which said jacket is softened sufficiently to flow into contact with and adherently join said sheets to said core, said core remains solid forming an insulating spacer which maintains said sheets spaced a predetermined distance from each other.

4,121,132

PHOSPHOR COATING METHOD AND RESULTING FLUORESCENT LAMP

Robert W. Repsher, Bloomfield, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 28, 1977, Ser. No. 837,069
Int. Cl.² C09K *11/42;* H01J *61/46*
U.S. Cl. 313—486 **10 Claims**



1. In combination with a fluorescent lamp comprising a sealed elongated light-transmitting glass envelope enclosing a discharge-sustaining filling and operating electrodes supported proximate the ends thereof and adapted to have a radiation-generating discharge maintained therebetween, an improved phosphor coating carried on the envelope interior surface and comprising:

(a) a predetermined coating weight of preselected finely divided phosphor particles carried on the interior surface of said envelope; and

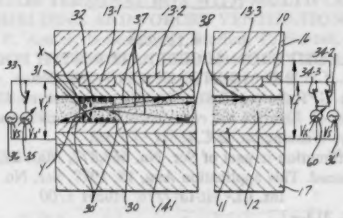
(b) said phosphor particles firmly bound both to one another and to the interior envelope surface by a melted and solidified mixture of boric anhydride and sodium borate, the combined weight of sodium borate plus boric anhydride (expressed in terms of an equivalent amount of boric acid prior to heating and melting) being from about 1% to 3% by weight of the phosphor, and the relative weight ratios of sodium borate to boric anhydride (expressed in terms of an equivalent amount of boric acid prior to heating and melting) being from about 1:2 to 1:4.

4,121,133

DIELECTRIC FOR MULTIPLE GASEOUS DISCHARGE DISPLAY/MEMORY PANEL HAVING IMPROVED VOLTAGE CHARACTERISTICS

Roger E. Ernsthausen, Lucky, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 293,817, Oct. 2, 1972, which is a continuation-in-part of Ser. No. 60,376, Aug. 3, 1970, abandoned. This application Aug. 9, 1973, Ser. No. 385,740
Int. Cl.² H01J *1/90*
U.S. Cl. 313—518 **6 Claims**



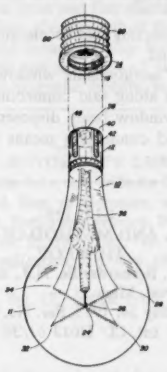
1. As an article of manufacture, a dielectric charge storage body for a gaseous discharge panel, said dielectric body being selectively enriched with at least one element selected from the group consisting of lithium, sodium, potassium, cesium, beryllium, magnesium, calcium, strontium and barium in an amount sufficient to provide gas discharge device operating voltages which are substantially uniform and which do not significantly change with time after a period of aging.

4,121,134

ROTATABLE MULTIPLE FILAMENT LAMP AND SOCKET ADAPTER

James Francis Fontenelle, 928 Clouet St., New Orleans, La. 70117

Filed Oct. 27, 1977, Ser. No. 845,999
Int. Cl.² H01K *1/62*
U.S. Cl. 315—64 **2 Claims**



1. A multiple filament lamp, lightable one filament at a time and comprising in combination:

(a) Non-conducting base means having a bottom terminal and a plurality of recessed side terminals for defining a plurality of open circuits therebetween, and having a circumferential retainer recess exteriorly defined adjacent an end of said base means with a retainer snap ring mounted in said recess;

(b) Glass bulb means, having the same plurality of filaments

therein as said plurality of recessed side terminals in said base means, fixed on the end of said base means adjacent said circumferential recess, said plurality of filaments having a side of all said filaments connected to said bottom terminal means, and other side of each filament of said plurality of filaments connected to said respective side terminals recessed in said base means; and

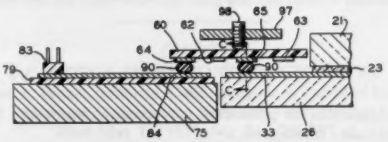
(c) Socket adapter means, adapted to screw into a standard lamp socket having energized bottom and side terminals, and defining and opening for slidably receiving and replaceably retaining said base and bulb means for free rotation therein and with said bottom terminal of said base means registering with said energized bottom terminal of said standard lamp socket, and with conducting means mounted in said socket adapter means for sequentially registering said plurality of side terminals of said base means with said energized side terminal of said standard lamp socket as said base and bulb means are rotated, thereby sequentially energizing said filaments one at a time.

4,121,135

APPARATUS FOR INTERFACING WITH PLASMA TYPE DISPLAY PANELS

Raymond L. Hunt; Ben H. Lin; Thomas A. Ream; Gene D. Robertson, and John H. Young, all of Fort Wayne, Ind., assignors to The Magnavox Company, Fort Wayne, Ind.

Filed Dec. 20, 1976, Ser. No. 745,335
Int. Cl.[2] H05B *37/00, 41/00*
U.S. Cl. 315—169 R **13 Claims**



1. An improved interface apparatus for use with a relatively flat discharge display panel of the type having row and column electrodes for forming discrete discharge cites thereon and having an outer periphery and extensions on at least two sides of the periphery, the extensions having input terminal contacts connected to the row and column electrodes for connection to circuitry essential to the operation of the display panel, the improved apparatus comprising:

circuit means having input terminals and output terminal contacts and having electrical conductors for providing electrical inter-connections between predetermined ones of the input terminals and predetermined ones of the output terminal contacts;

a plurality of circuit modules for providing at least a part of the display panel operating circuitry and having input and output terminal contacts connected to the circuitry, the input and output terminal contacts of the circuit modules being adapted to releasably overlay and mate with the output terminal contacts and the input terminal contacts of the respective circuit means and the display panel;

module clamping means for releasably receiving and holding said circuit modules in positions about the extensions of the display panel for providing said mating of said circuit module contacts with said contacts of the display panel and circuit means whereby electrical interface connections are provided between the input terminals of said circuit means and the plurality of the releasably received circuit modules and between the plurality of the modules and the display panel; and

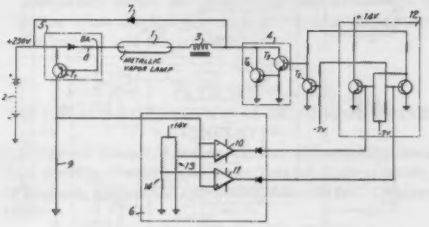
a plurality of electrically conductive and compressible elastomeric pads interposed between at least the output terminal contacts of said circuit means and the input terminal contacts of the received circuit modules.

4,121,136

APPARATUS FOR FEEDING DISCHARGE LAMPS FROM A DIRECT CURRENT SOURCE

Jean-Claude Fournier, and Albert Hermitte, both of Toulon, France, assignors to Etat Francais, Paris, France

Filed May 12, 1977, Ser. No. 796,483
Claims priority, application France, May 18, 1976, 76 14881
Int. Cl.[2] H05B *41/36*
U.S. Cl. 315—205 **7 Claims**



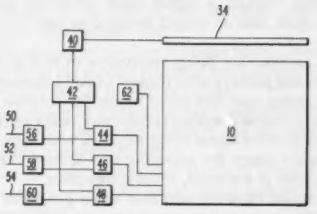
1. Power supply apparatus for feeding a discharge lamp comprising a choke and a direct current source mounted in series with the discharge lamp, said apparatus further comprising means for chopping direct current including an electronic switch and a detector of current intensity mounted in series with said choke, first comparator means comparing the intensity of the current to a fixed maximum level from a D.C. source for opening the switch when the maximum level is reached and second comparator means comparing the intensity of the current to a fixed minimum value from a D.C. source for closing the switch when the minimum value is reached such that the intensity of the current always remains between these two values.

4,121,137

SYSTEM FOR ACHIEVING IMAGE UNIFORMITY IN DISPLAY DEVICES

Thomas Lloyd Credelle, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 12, 1976, Ser. No. 741,403
Int. Cl.[2] H01J *29/70, 29/72*
U.S. Cl. 315—366 **8 Claims**



1. A system for achieving brightness uniformity in an image display device having a plurality of electron beams modulatd by a brightness signal, said system comprising:

means for sensing the electron current of each electron beam with an electron collector upon which the electron beams impinge;

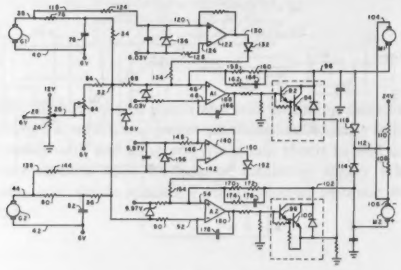
means for storing the sensed electron beam current information; and

means for modifying the brightness signal in response to the stored electron beam current information so as to compensate for non-uniform electron beam currents.

4,121,138
SERVO SYSTEM

John R. Flint, Barrington; Rolf B. Erikson, Lincolnwood, and George Rabindran, Morton Grove, all of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed May 31, 1977, Ser. No. 801,703
Int. Cl.[2] B65H 77/00
U.S. Cl. 318—7 4 Claims



1. In a web transport system for advancing a web between first and second spools rotated, respectively, by first and second drive motors, a system for controlling the speed and direction of rotation of the spools, comprising:

means for generating a DC reference voltage;

means for generating a control voltage which is representative of the desired speed and direction of rotation of the first and second spools and which is a selectably variable DC voltage whose magnitude is variable between levels above and below the level of said reference voltage;

first and second servo generators for generating electrical outputs representative of the direction and speed of rotation of the first and second spools, respectively, said outputs being negative with respect to said reference voltage when the spools rotate in a first direction and positive with respect to said reference voltage when the spools rotate in a second opposite direction;

means for continuously and algebraically summing the control voltage with the outputs of said first and second speed sensing means, the summed signal constituting a motor drive signal;

a first comparator having a reference input receiving said reference voltage, a signal input receiving said motor drive signal, and an output coupled to said first drive motor;

a second comparator having a reference input receiving said reference voltage, a signal input receiving said motor drive signal, and an output coupled to said second drive motor;

said first comparator being responsive to said motor drive signal being positive with respect to said reference voltage for actuating said first drive motor for rotation in a first direction, and said second comparator being responsive to said motor drive signal being negative with respect to said reference voltage for actuating said second drive motor for rotation in a second, reverse direction,

means coupled between said first servo generator and said first comparator and responsive to said first servo generator developing an output which is positive with respect to said reference voltage for applying a first bias voltage to the signal input of said first comparator, said bias voltage being of a magnitude sufficient to ensure that said first comparator actuates said first drive motor whenever the output of said first servo generator is positive with respect to said reference voltage; and

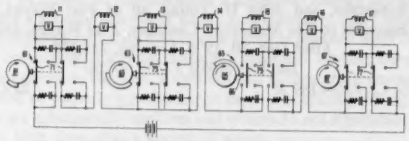
means coupled between said second servo generator and said second comparator and responsive to said second servo generator developing an output which is negative with respect to said reference voltage for applying a second bias voltage to the reference input of said second comparator, said second bias voltage being of a magnitude sufficient to ensure that said second comparator actuates said second drive motor whenever the output of said second servo generator is negative with respect to said reference voltage,

whereby said first and second bias voltages compensate for internal offset voltages in said first and second comparators, respectively, to ensure that said first drive motor is actuated whenever said first servo generator develops an output positive with respect to said reference voltage, and that said second drive motor is actuated whenever said second servo generator develops an output negative with respect to said reference voltage.

4,121,139
MAGNETIC APPARATUS FOR PRODUCING MOVEMENT

J. William Putt, 3278 W. Cedar St., Allentown, Pa. 18104

Continuation-in-part of Ser. No. 634,568, Nov. 24, 1975, abandoned. This application Jan. 10, 1977, Ser. No. 758,227
Int. Cl.[2] H02K 33/16
U.S. Cl. 318—134 15 Claims



1. Apparatus for producing movement, comprising

a plurality of magnets,

means for supporting said magnets for relative movement along an axis with pairs of adjacent said magnets being movable from mutually proximate relative positions to mutually distant relative positions where the distance between them is increased by a given distance, at least two of said magnets being movable both relative to each other and relative to a third said magnet,

means for changing the polarity of one of each adjacent pair of magnets to move the adjacent magnets between their mutually proximate relative positions and their mutually distant relative positions,

one of said magnets being a driven magnet which is movable along said axis through a distance which is equal to the total of said given distances, and

output means connected to said driven magnet.

4,121,140
MOTOR CONTROL CIRCUIT

Melvin L. Jones, Irving, Tex., assignor to Overhead Door Corporation, Dallas, Tex.

Filed Mar. 4, 1977, Ser. No. 774,256
Int. Cl.[2] H02P 1/44
U.S. Cl. 318—221 R 7 Claims

1. A motor control circuit for preventing automatic restarting of an electric motor following an interruption of electric current flow therethrough, comprising:

electric power terminals energizable from an electric current source;

an electric motor comprising, in series, winding means and an automatic reset thermal overload protector, said motor having terminals for electrical connection to said winding means and protector;

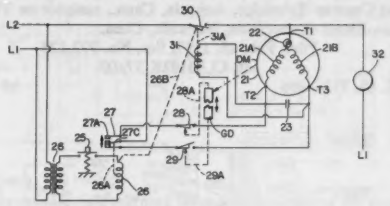
a current supply switch means actuable to a state for serially

connecting said motor winding means and protector across said electric power terminals;

a start switch;

a first switch control means associated with said current supply switch means and energizable by said start switch for switching said current supply switch means to said connecting state in response to actuation of said start switch;

a second switch control means connected across a pair of said motor terminals for energization with said motor; and



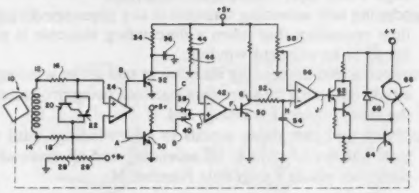
a common restart prevention switch connected in series with said current supply switch means and motor across said electric power terminals, and means connecting said common restart prevention switch to said first switch control means for closure thereby to permit current flow to said motor while said start switch is being actuated and also connecting said common restart prevention switch to said second switch control means for continuing and existing flow of current through said common switch to said motor, but for otherwise blocking current flow to said motor.

4,121,141

D.C. MOTOR SPEED CONTROL CIRCUITRY

Jerome A. Frazee, Milpitas, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed May 13, 1977, Ser. No. 796,587
Int. Cl.[2] H02P 5/16
U.S. Cl. 318—326 **6 Claims**



1. Circuitry for controlling the speed of a D.C. motor having means for generating an A.C. output signal proportional to the rotational speed of said motor, said control circuitry comprising:

first operational amplifier means coupled to receive the A.C. output signal proportional to the rotational speed of said motor and coupled to a first source of reference potential to thereby generate first and a second square wave output signals, said first and said second square wave output signals being complementary to each other, and being at a frequency proportional to the frequency of said A.C. output signal;

first integrating means coupled to the first operational amplifier means for integrating the second square wave signal;

OR gate means coupled to the first integrating means and to the first operational amplifier means for combining the first square wave signal with the integrated second square wave signal;

second operational amplifier means coupled to the OR gate means to receive the output signal therefrom and coupled to a second reference voltage source for producing a third square wave signal;

second integrating means coupled to receive and integrate the signal from the second operational amplifier means;

comparison means for comparing the integrated pulses from said integrating means with an adjustable D.C. speed control reference voltage; and

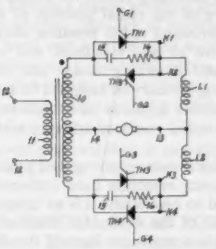
variable duty cycle switching means in circuit with the D.C. motor, said switching means coupled to the output of said comparison means for conducting current through said motor when said speed control reference voltage exceeds the level of said integrated pulses.

4,121,142

FULL-WAVE BIDIRECTIONAL DC MOTOR DRIVE CIRCUIT

Alfred Harold Morser, Letchworth; Roy Gibson, Biggleswade; Paul Szekely, Watford, and Bruce Trayton Parker, Luton, all of England, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Sep. 20, 1977, Ser. No. 834,844
Int. Cl.[2] H02P 5/16
U.S. Cl. 318—345 C **6 Claims**



1. A full-wave DC motor control circuit responsive to a bipolar command signal for controlling an AC input signal being provided to a supply transformer, said supply transformer having a center tap of a secondary winding connected to one of two leads of a motor armature, the control circuit comprising:

(a) a center tapped choke having the center tap connected to the other lead of the motor armature;

(b) a first pair of thyristors having

(1) the anode of the first thyristor being connected to the cathode of the second thyristor and one end of the supply transformer, and

(2) the cathode of the first thyristor being connected to the anode of the second thyristor and one end of the choke;

(c) a second pair of thyristors having

(1) the anode of a third thyristor being connected to the cathode of the fourth thyristor and the other end of the supply transformer, and

(2) the cathode of the third thyristor being connected to the anode of the fourth thyristor and the other end of the choke;

(d) means responsive to each zero crossing of the AC input signal for generating a ramp funtion signal; and

(e) means responsive to the command signal and the generating means for alternately triggering between the pairs of thyristors with each half cycle of the AC input signal to produce a current flow through the motor armature thereby causing the motor to move in accordance with the command signal, said triggering means being effective in response to a zero command signal to simultaneously trigger one thyristor in each pair of thyristors to produce a current flow through the triggered thyristors, the supply transformer and the choke but not through the motor armature.

4,121,143

DEVICE FOR COMPENSATING SYNCHRONOUS DISTURBANCES IN THE MAGNETIC SUSPENSION OF A ROTOR

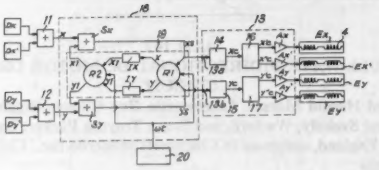
Helmut Habermann; Maurice Brunet, and Pierre Joly, all of Vernon, France, assignors to Societe Anonyme dite: Societe Europeene de Propulsion, Puteaux, France

Filed Dec. 17, 1976, Ser. No. 751,941

Claims priority, application France, Dec. 24, 1975, 75 39759

Int. Cl.[2] G05B *11/01*

U.S. Cl. 318—629 **6 Claims**



1. A magnetic suspension system for a rotor, comprising at least one active radial electromagnetic bearing having electromagnetic windings; detecting means for producing a position signal representative of the radial position of the rotor with respect to a predetermined radial position; energizing means for supplying current to said windings; and a servo-circuit coupled between said detecting means and said energizing means for controlling the current supplied to said windings in response to said position signal so as to maintain the rotor in said predetermined radial position, wherein said servo-circuit comprises:

band rejection filter means receiving said position signal and having a frequency rejection band centered on a central frequency equal to $n \cdot \omega$, where n is an integer and ω is the rotational speed of the rotor, for eliminating from said position signal a component having the frequency $n \cdot \omega$, and

means for generating a signal representative of the rotational speed ω of the rotor and connected to said band rejection filter means for continuously slaving said central frequency of said frequency rejection band to the value $n \cdot \omega$.

4,121,144

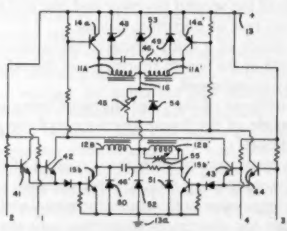
STEPPING MOTOR ENERGIZING CIRCUIT AND METHOD FOR MINIMIZING STEP POSITION ERROR

Albert C. Leenhouts, Harwinton, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed Jan. 24, 1977, Ser. No. 761,850

Int. Cl.[2] H02K *37/00*

U.S. Cl. 318—696 **10 Claims**



1. A circuit for energizing a stepping motor having a plurality of step positions and having two windings that are simultaneously maintained energized to maintain each step position with the circuit minimizing step position error caused by current imbalance in the two windings by causing the same value of current to flow in each winding comprising a source of unidirectional power, a pair of connections to each winding, means for connecting the windings in series with each other across the source of power by one of each pair of connections being connected together and switch means connected in series with the other one of the connections of each winding and the source of power, said switch means including means for changing the current flow in one winding independently of the other winding and for reversing the effective direction of current flow in either winding independently of the other winding.

4,121,145

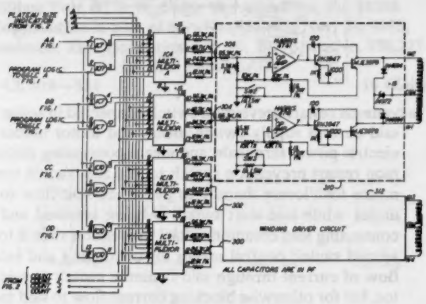
HIGH RESOLUTION STEPPING MOTOR DRIVE

Paul Conway Talmadge, Ansonia, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Feb. 25, 1977, Ser. No. 772,178

Int. Cl.[2] H02K *37/00*

U.S. Cl. 318—696 **18 Claims**



1. A method for controlling the rest position of a multipole stepping motor comprising the steps of:

applying an energizing signal to each winding such that each signal comprises a leading edge which is an ascending staircase having a selectable number of steps and a trailing edge of a descending staircase having said selectable number of steps and a plateau between the leading and trailing edge which is at a selectable magnitude;

producing said ascending staircase in any given winding at a time preceding that when a descending staircase is produced in an adjacent winding;

producing said descending staircase in said given winding at a time following an ascending staircase being produced in the other adjacent winding; and

applying said energizing signals to said windings until the total number of steps in all ascending and all descending staricases equals a selectible Number N.

4,121,146

BATTERY CHARGING SYSTEMS FOR ROAD VEHICLES

William Frank Hill, Stafford, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Mar. 1, 1977, Ser. No. 773,271

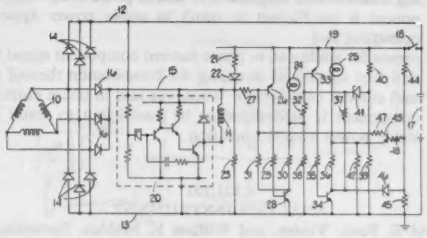
Claims priority, application United Kingdom, Mar. 3, 1976, 8422/76

Int. Cl.[2] H02J *7/14*

U.S. Cl. 320—48 **7 Claims**

1. A battery charging system for a road vehicle, comprising an alternator having an armature and a field winding, first, second and third supply lines, a further supply line, a full wave rectifier connecting the armature to first and second supply lines for connection to the battery to be charged, an auxiliary rectifier connecting the armature to a third supply line which is at substantially the same voltage as the first supply line when the alternator is running, a voltage regulator circuit by means of which the field winding is connected between the second and third supply lines, a switch connecting the first line to a further supply line, a resistor and a diode connected in series between the further and third supply lines, said diode conduct-

ing when the voltage on the third supply line is lower than that on the further line, a current path of high impedance relative to the impedance of said resistor interconnecting the second and third supply lines, a first warning lamp, means sensitive to the voltage between the further and third supply lines for illuminating the first warning lamp, means sensitive to the voltage



drop across said first warning lamp for illuminating the second warning lamp when said voltage drop across the first warning lamp exceeds a predetermined value, and an over-voltage sensing means for illuminating said second lamp when the voltage between the further and second supply lines exceed a threshold value.

4,121,147

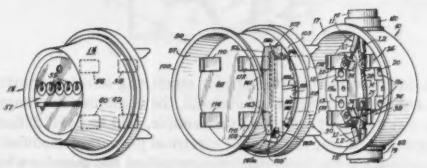
ELECTRIC METER FOR MOUNTING WITH A STANDARD WATTHOUR METER

Dale F. Becker, Seneca, S.C.; Trevor N. Samuel, Rochester, Ill., assignor to Sangamo Electric Company, Springfield, Ill.

Continuation of Ser. No. 538,164, Jan. 2, 1975, abandoned. This application Sep. 13, 1976, Ser. No. 722,594

Int. Cl.[2] G01R *19/16, 1/04*

U.S. Cl. 324—104 **12 Claims**



1. In an electrical meter for use with a standard watthour meter and a standard meter socket, a housing including a display area, a meter receiving section comprising a base plate, a plurality of jaw members supported by said base plate and positioned on said base plate to receive the blades of a standard watthour meter, meter socket engaging means comprising a plurality of blades extending rearwardly of said housing and positioned to engage the jaws of a standard meter socket, an electrical meter assembly supported within a longitudinally disposed part of said housing and in tandem relation with said watthour meter and said meter socket, said electrical meter assembly including an indicator located adjacent said display area, a plurality of conductor means connecting said blade members to said jaw members, and means for coupling said electrical meter assembly to at least one of said conductor means to provide a power measurement on said indicator, said housing including the elctrical meter assembly being located within a circumference defined by the rearward projection of the circumference of the base of said standard watthour meter.

4,121,148

BRUSHLESS SYNCHRONOUS GENERATOR SYSTEM

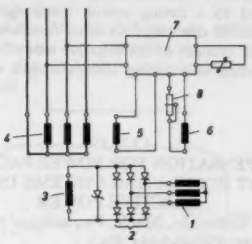
Hubert Platzer, Linz, Austria, assignor to Dipl.-Ing. Hitzinger & Co., Linz, Austria

Filed Apr. 25, 1977, Ser. No. 790,263

Claims priority, application Austria, Apr. 27, 1976, 3079/76

Int. Cl.[2] H02K *19/34;* **H02P** *9/14*

U.S. Cl. 322—59 **6 Claims**



1. A brushless synchronous generator system, comprising

a generator having a stator which is provided with a multipole main winding and with an auxiliary winding, which is separate from and has the same number of poles as said main winding and a coil width not in excess of one-half of the pole pitch of said main winding,

an exciter having a field exciting winding, and

a controller connected between said auxiliary winding and said field-exciting winding to energize the latter.

4,121,149

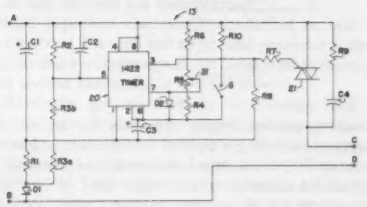
TIMING CONTROL FOR AC POWER CIRCUIT

Daniel A. Seltzer, Richardson, Tex., assignor to DAS Design Corporation, Dallas, Tex.

Filed Dec. 30, 1976, Ser. No. 755,454

Int. Cl.[2] H05B *9/06*

U.S. Cl. 323—19 **12 Claims**



1. Circuitry for variable control of an AC power circuit comprising

a first timing circuit means responsive to varying DC input control voltage levels for producing, alternately, high and low DC output voltage levels; said timing circuit means including an output, an input for a control voltage, and means for comparing an input control voltage with upper and lower trigger voltage levels for switching the timing circuit output between high and low voltage levels;

a second power supply circuit means, coupled to the AC power circuit, for producing a selected DC supply voltage for said first circuit means and other circuit means;

a third switching circuit means including a DC operated electronic, alternating current switch for selectively opening and closing said AC power circuit; the DC operating circuit for said switch being connected between the positive side of said DC power supply and said timing circuit output;

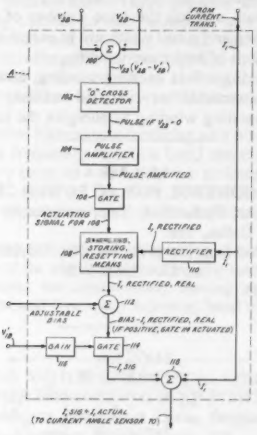
a fourth control voltage circuit means for producing a con-

trol voltage which increases or decreases at a selected rate; said control voltage circuit means including variable resistance means connected directly between the positive side of said DC power supply and said timing circuit input, and a capacitor connected between said timing circuit input and the negative side of said DC power supply; said variable resistance means including a wiper contact connected to said timer circuit input through a series connected diode passing current to said input, and connected to a timing circuit discharge terminal; said timing circuit discharge terminal functioning to connect said wiper contact to the negative side of said DC power supply when said timing circuit output voltage level is low.

4,121,150
GAIN COMPENSATION FOR POWER FACTOR IN LINE CURRENT REGULATING SYSTEMS INVOLVING REACTIVE POWER

Fred William Kelley, Jr., Media, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Jul. 25, 1977, Ser. No. 818,363
Int. Cl.[2] G05F *1/68;* H02J *3/18*
U.S. Cl. 323—102 **15 Claims**



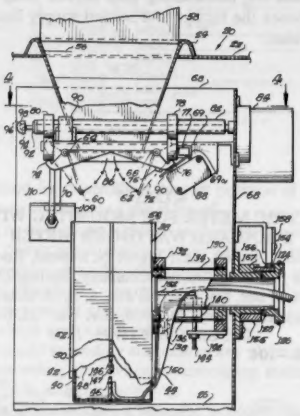
9. Reactive current supply apparatus for an a-c electric power system including a critical voltage supply bus electrically separated by series impedance from load terminals which are adapted for connection to a major load subject to rapid oscillatory variation of reactive current demand comprising: fixed capacitor means connected across said load terminals, fixed inductor means connected across said load terminals in series circuit relation with static switching means, said static switching means including gating means for phase controlling the conduction angle of said switching means thereby to control the magnitude of reactive current traversing said inductor means, means for generating a unidirectional electrical signal representative in direction of the phase relation of the reactive component of load current at said load terminals and representative in magnitude to the magnitude of said reactive component of load current, means responsive to said electric signal for so controlling said gating means that the sum of the reactive currents traversing said fixed capacitor means and said fixed inductor means is substantially equal and opposite to said reactive component of load current, and, means for deriving first and second signals respectively representative of the line current and line to neutral voltage at said critical voltage supply bus, means including a current angle sensor for sensing the magnitude of the phase angle between said first and second signals and directing an output signal therefrom to said static switching means so as to regulate the phase angle, wherein the improvement comprises:

a. means for sensing the magnitude of the in phase component of said line current at said critical bus and producing an output signal which is representative thereof;
b. means for receiving said output signal representative of the in phase component of said line current and determining whether said magnitude of said in phase current component is insufficient to result in stable power system operation; and
c. means for adding an in phase current component signal to said first signal and directing the combination thereof to said current angle sensor whenever said in phase current component is determined to be insufficient to result in stable power system operation.

4,121,151
ANALYSIS INSTRUMENT

David B. Funk, Virden, and William E. Midden, Springfield, both of Ill., assignors to Dickey-john Corporation, Auburn, Ill.

Filed Apr. 27, 1977, Ser. No. 791,651
Int. Cl.[2] G01R *27/26*
U.S. Cl. 324—61 R **20 Claims**



1. In an analysis instrument for measuring selected constituent contents of a sample of material, the combination comprising: a test cell for receiving said sample, said test cell defining a capacitor having measurable electrical properties modified in accordance with the dielectric constant of the sample, which dielectric constant is a function of the contents thereof, means for producing an output condition corresponding to the bulk density of a sample including means for adjusing the volume of the sample received in said test cell to a predetermined constant volume and weighing means for producing an output condition corresponding to the weight of said sample in said test cell, said measurable electrical properties of said capacitor and said bulk density output condition producing means coacting to give measurable outputs indicative of the selected constituent contents of said sample in the test cell.

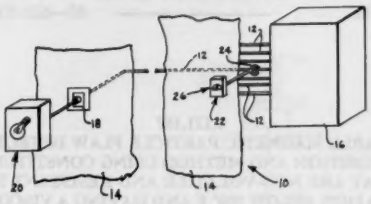
4,121,152
METHOD AND APPARATUS FOR TRACING ELECTRICAL CABLES

Edgar C. Hale, 1261 Via Esperanza, San Dimas, Calif. 91173, and Stephen R. Troy, 104-20 89th Ave., Richmond Hill, N.Y. 11418

Filed May 17, 1976, Ser. No. 687,284
Int. Cl.[2] G01R *19/16*
U.S. Cl. 324—66 **1 Claim**

1. A method of tracing electrical cables between an outlet

and a circuit breaker, said method comprising the steps of electrically connecting a pulsing electrical load means having a load element, a silicon controlled rectifier for connecting and disconnecting the load across the outlet, a diode, a resistor and a capacitor forming a time delay circuit connected across the outlet and a voltage sensitive silicon trigger diode switch responsive to the voltage level on the time delay circuit for triggering the silicon controlled rectifier to said outlet, adjusting the amount of additive current passed by said pulsing load to a value proportional to the existing load current in said cables whereby said additive current can be readily detected, placing a clamp-on ammeter sequentially about each of a plurality of said cables and detecting a fluctuation in current flow with said clamp-on ammeter corresponding to the fluctuation in current being drawn by said pulsing load while said clamp-on ammeter is clamped about said cable.

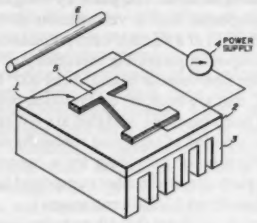


4,121,153

TAPERED RESISTOR METER

David D. Thornburg, Los Altos, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 3, 1976, Ser. No. 747,166
Int. Cl.[2] G01R *19/00*
U.S. Cl. 324—96 **1 Claim**



1. An improved analog meter which has no moving parts and which is substantially electric field insensitive comprising:

a tapered resistor device comprised of (1) an electrically resistive element having a tapered form, and (2) a layer of a thermally quenched phosphor material operatively associated with said electrically resistive element, said phosphor material exhibiting a change in color contrast when it is both (*i*) heated beyond a threshold temperature and (*ii*) viewed under light of ultraviolet wavelength,

means for coupling said electrically resistive element to a current surce, said electrically resistive element developing a non-uniform temperature profile on electrical energization due to its tapered form whereby said electrically resistive element heats a portion of said layer of phosphor material to beyond said threshold temperature, the magnitude of the portion of said phosphor heated to beyond said threshold temperature being related directly to the magnitude of the current from said current source, and

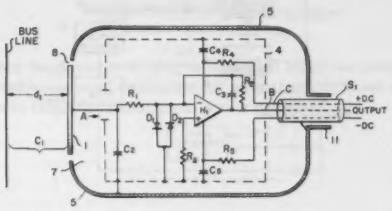
means for illuminating said layer of phosphor material with light of ultraviolet wavelength whereby the portion of said phosphor heated to beyond said threshold temperature exhibits a color which is in contrast to the color of other portions of said layer of phosphor material such that the magnitude of the current from said current source is indicated.

4,121,154

ALTERNATING CURRENT POTENTIAL MEASURING DEVICE

Charles M. Keating, Portland, Oreg., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Continuation of Ser. No. 622,345, Oct. 14, 1975, abandoned. This application Dec. 10, 1976, Ser. No. 749,584
Int. Cl.[2] G01R *1/20, 15/04*
U.S. Cl. 324—126 **5 Claims**



1. A voltage measuring apparatus for measuring the magnitude of the voltage on an alternating current power line without physically contacting said line with the apparatus comprising in combination:

an elongated power line attached to and supported above the earth for carrying a high voltage alternating current, said line forming a first electrode;

a voltage sensing apparatus having a second electrode with a generally flat planar surface which is adapted to face towards and substantially parallel with the elongated length of said power line, said second electrode also being spaced a known distance from said first electrode with ambient gas therebetween;

said first and second electrodes acting as a first capacitor with said ambient gas therebetween;

a second capacitor electrically connected to said second electrode at one side and to ground potential at the other side so that a voltage signal can be impressed thereon from said second electrode;

an electrically grounded shield surrounding said second electrode on all sides excepting its planar surface facing towards and parallel to said power line, said second electrode being supported by an insulated support means relative to said electrically grounded shield, said grounded shield surrounding and being connected to said second capacitor at its ground potential side and said grounded shield being supported by means of a pole above the earth;

circuit means encompassed by said grounded shield for detecting the magnitude of said voltage signal and converting it to a second electrical signal representative of the voltage drop between the first and second electrodes; and

remote readout means outside of said grounded shield electrically connected to said circuit means for displaying the magnitude of said second signal.

4,121,155

POSITION READOUT DEVICE

Jacques R. Chamuel, Allston, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Dec. 2, 1976, Ser. No. 747,072
Int. Cl.[2] G01R *33/00*
U.S. Cl. 324—207 **36 Claims**

1. A position determining system comprising

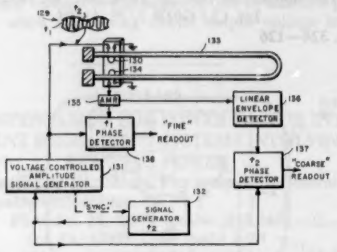
at least one delay element capable of supporting a traveling wave signal;

signal producing means;

at least one driver transducer means located at at least one position at said delay element;

at least one receiver transducer located at at least one other position of said delay element;

said driver transducer means being responsive to said signal producing means for causing a traveling wave to propagate along said delay element from said at least one position to said at least one other position so that said traveling wave signal traverses a distance to be measured more than once;



means responsive to the signal at said at least one driver transducer means and the signal received at said at least one receiver transducer means for determining the distance between a reference position fixed with respect to said delay element and the position of one of said driver transducer means or receiver transducer means; and

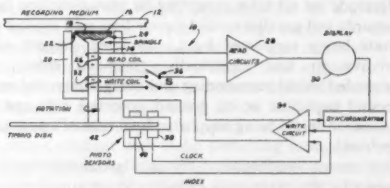
means for substantially reducing reflections of said traveling wave signal in said delay element.

4,121,156

ROTATING SPINDLE AND STATIONARY TRANSDUCER DEVICE FOR SENSING THE PREFERRED MAGNETICALLY PERMEABLE ORIENTATION IN MAGNETIC MEDIA

Arthur Barnhart Olson, Edina, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Oct. 21, 1977, Ser. No. 844,330
Int. Cl.[2] G01R 33/12
U.S. Cl. 324—210 **2 Claims**



1. A magnetic orientation sensor for magnetic recording media comprising:

a transducer consisting of a cylindrical structure having a generally circular shaped planar face perpendicular to the cylindrical axis said cylindrical structure having an axial, longitudinal central opening,

a rotatable spindle mounted in the central opening of said transducer, said spindle having a head portion having a generally flat face co-planar with the face of said cylinder,

a longitudinal element of magnetic material mounted in the face of the head portion of said spindle, extending from one edge of the face to the other and forming a pair of flux gaps with said transducer, and

at least one coil magnetically coupled to said spindle and within said transducer for applying drive signals and for receiving signals induced

said sensor, in operation, being disposed with the faces of said cylinder and said spindle in a parallel plane and proximate to a sample of essentially planar recording media.

4,121,157

CASTABLE MAGNETIC PARTICLE FLAW DETECTION COMPOSITION AND METHOD USING CONSTITUENTS THAT ARE NON-VOLATILE AND RESISTANT TO OXIDATION BELOW 100° F AND HAVING A VISCOSITY LESS THAN 12,000 CENTIPOISES

Henry J. Weltman; Mark T. Carroll; John E. Halkias; William T. Kaarlela, and Jack D. Reynolds, all of Fort Worth, Tex., assignors to General Dynamics Corporation, Fort Worth, Tex.

Filed Jul. 5, 1977, Ser. No. 812,873
Int. Cl.[2] G01R 33/12
U.S. Cl. 324—216 **17 Claims**

11. A composition forming a room temperature vulcanizable casting material for precise visual inspection of magnetically inductive substances by application of the material directly to a workpiece to be inspected, solidifying in situ to elastic flexible form and removing the casting, for determining and permanently recording the presence of flaw or flaws in the workpiece by migration of visible magnetizable particles in the composition to the flawed area when the workpiece and casting material are subjected to an effective magnetic flux comprising: a base formulation having:

a. a proportion of about 100 parts by weight of polymeric rubber compound that is vulcanizable at room temperature by addition of a suitable catalyst material thereto; said rubber compound consisting essentially of only constituents that are non-volatile below about 100° F so as to resist shrinking, that are resistant to oxidation below about 100° F so as to resist rancidity, and that are not exuded from the rubber for a period of time; said rubber having a first color that is effective for providing for a contrast with ferromagnetic particles; said rubber compound having a viscosity less than about 12,000 centipoises;

b. a proportion of about 0.1–10 parts by weight of visible ferromagnetic particles in the size range of about 0.8 to about 10 microns; said ferromagnetic particles having a second color that contrasts with said first color to facilitate visual observation of anomalous concentrations and alignments of said ferromagnetic particles;

c. a diluent that contains only constituents that are non-volatile below about 100° F so as to resist shrinkage, that are resistant to oxidation below about 100° F so as to resist rancidity and that will not be exuded from the base formulation after it is removed from the surface of the workpiece; said diluent consisting essentially of a material that is compatible with said polymer rubber composition and miscible with said rubber in all proportions from about 1 to 4 to about 4 to 1; said diluent having a sufficiently low viscosity and being in a proportion such that its admixture with said rubber is brought to the range of from about 100 to about 1000 centipoises before application to the surface of said workpiece; and

a proportion of about 0.2 to about 6 parts by weight per 100 parts of said base formulation of catalyst for vulcanizing said rubber compound to said flexible elastic form so as to immobilize said ferromagnetic particles that have migrated to any flaw under the influence of a magnetic field.

4,121,158

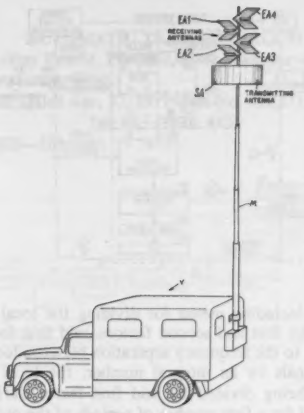
RADIO SYSTEM

Manfred Hanni, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich

Continuation of Ser. No. 552,163, Oct. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 324,067, Jan. 11, 1973, abandoned. This application Oct. 22, 1976, Ser. No. 736,164

Int. Cl.[2] H04B 1/38, 7/04

U.S. Cl. 325—55 11 Claims



1. A radio system including a large number of transmitting receiving exchanges spatially distributed over an area and each connected to and serving a large number of individual subscribers who may become interconnected via another such exchange, each of said exchanges comprising means providing a plurality of radio frequency voice channels of different frequency within a frequency range that is fixed for the system, means for pulse modulating signals in said voice channels, a vocoder for reducing the bandwidth of the individual signals in a voice channel, means for transmitting said voice channels including an omnidirectional antenna which radiates toward the other exchanges with little grouping in the plane determined by the exchange, a plurality of means for receiving transmissions from other exchanges including a plurality of directional antennas which group both in the horizontal and vertical planes, and means for connecting said receiving means to a subscriber connected to the exchange.

4,121,159

METHOD FOR THE SYNCHRONIZATION OF A TRANSMISSION PATH

Ernst Lampert, Unterpfaffenhofen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

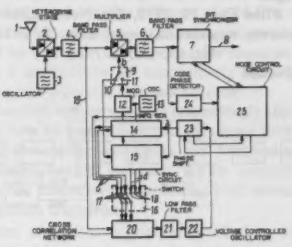
Filed Oct. 28, 1971, Ser. No. 195,062

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1970, 2054734

Int. Cl.[2] H04B 1/10; H04L 7/00

U.S. Cl. 325—65 8 Claims

1. A method of synchronizing the transmitting and receiving apparatus of a transmission system which operates on a time or code multiplex SSMA basis wherein information is transmitted in a broad frequency band compared to the base band normally occupied thereby, comprising the steps of: at the transmitting apparatus, frequency shift modulating an oscillation and digitally phase modulating each frequency element of the frequency modulated oscillation with a unique phase modulation, and transmitting the dual modulated signal at the beginning of information transmittal; and at the receiving apparatus, receiving the dual modulated signal; producing a frequency and phase modulated signal equal to that received; multiplying the produced signal with respect to its phase while comparing the power thereof with the power of the received signal to detect a power maximum of the multiplied signal in a narrow frequency band, and switching to operation under the control of a locally produced oscillation for normal synchronous conditions in response to maximum power detection.



4,121,160

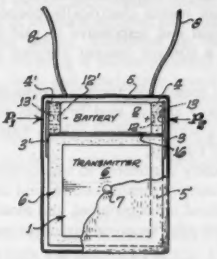
SWITCH MEANS FOR RADIO ALARM DEVICE

Thomas R. Cataldo, 5169 Princess Ann Dr., La Canada, Calif. 91001

Filed Mar. 22, 1977, Ser. No. 780,011

Int. Cl.[2] H04B 1/034

U.S. Cl. 340—321 4 Claims



1. In a miniature alarm transmitter device adapted to be worn on the body of a person under the clothing:

a battery, and

a miniature radio transmitter built on a circuit board, said battery having a terminal at each of its opposite ends and extending generally parallel to one side portion of said board;

a pair of resilient metal spring contact and support members each secured to said side portion adjacent one of said terminals and having a contact portion extending generally outward opposite to one of said terminals;

a pair of ring-like resilient insulating spacers each positioned between each said contact portion and its adjacent said terminal,

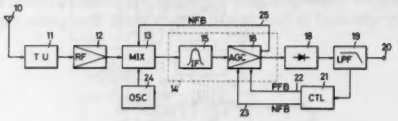
said spacers electrically separating both said contact portions and terminals and also supporting said battery by its said terminals from said members, and

an outer housing in the form of a soft flexible bag enclosing both said battery and transmitter, whereby squeezing pressure through said outer housing simultaneously against both said support members toward each other is adapted to press both said contacts against their respective battery terminals to activate said transmitter.

4,121,161
AM RECEIVER

Mitsuo Ohsawa, Fujisawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 19, 1975, Ser. No. 642,344
Claims priority, application Japan, Dec. 28, 1974, 50-3367
Int. Cl.[2] H04B 1/28
U.S. Cl. 325—404 7 Claims



1. In an AM receiver having an amplifier stage for amplifying received signals which vary from an extremely low level through a range of usable sensitivity to a high level, said amplifier stage including an automatic gain control means for providing gain variable between a maximum gain level and a minimum gain level, detector and filtering means coupled to said amplifier stage for providing an audio signal, and control means having an input coupled to said detector and filtering means and providing a control signal to said automatic gain control means for changing said gain thereof to a predetermined gain level intermediate said maximum and minimum gain levels when said received signals are at said extremely low level, to said maximum gain level when said received signals are within said range of usable sensitivity, and to said minimum gain level when said received signals are at said high level; said automatic gain control means comprising:

first and second bias voltage sources;

first and second input terminals receiving said control signal and said received signal, respectively;

control current means electrically connected to said first input terminal and responsive to said control signal for producing a control current varying with said control signal;

signal current means electrically connected to said control current means and to said first bias voltage source for producing a signal current which varies inversely with said control current;

means electrically connected to said control current means, said signal current means, said second bias voltage source and said second input terminal, and modulating said signal current with said received signal to produce an output signal; and

output terminal means electrically connected to said signal current means and receiving said output signal through the latter.

4,121,162
DIGITAL PHASE LOCKED LOOP TUNING SYSTEM

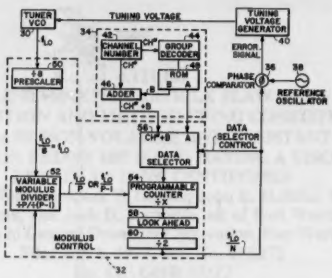
Jade Henry Alberkrack, and Stephen Earl Hilliker, both of Chandler, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 14, 1976, Ser. No. 695,875
Int. Cl.[2] H04B 1/16
U.S. Cl. 325—421 24 Claims

1. A digital phase locked loop tuning system responsive to a local oscillator signal for producing a frequency synthesized digital output signal which is utilized to control the frequency of the local oscillator, the local oscillator having a plurality of frequencies associated therewith corresponding, respectively, to a plurality of selectable channels, each of the channels being allocated to one of at least two channel groups with each channel in a particular channel group being separated from an adjacent channel in the particular channel group by a predetermined frequency spacing of the local oscillator, comprising:

programming means responsive to an input signal representing a selected channel number of a particular channel group for generating a first digital control signal having a value corresponding to the selected channel number and for generating a second digital control signal representative of said particular channel group, said second digital control signal being a constant predetermined value for all of said channel numbers that are within said group; and

programmable divider means coupled to said programming means being responsive to said first, second digital control signals and the local oscillator signal, in a local oscillator mode, for generating the digital output signal which is representative of a desired frequency corresponding to said selected channel number, said programmable divider

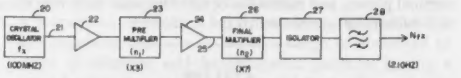


means including means for dividing the local oscillator signal by first and second factors, said first factor being related to the frequency separation between local oscillator signals by an integral number, the local oscillator signal being divided by said first factor during a first interval for a first number of periods of the output signal and being divided by said second factor for a second number of periods of the output signal, said first number of periods being related to the number of the channel selected, said second number being related to the channel group within which the selected channel lies.

4,121,163
LOW-NOISE MICROWAVE SIGNAL GENERATOR

Josef L. Fikart, Port Coquitlam, Canada, assignor to GTE Lenkurt Electric (Canada) Ltd., Burnaby, Canada

Filed Jul. 5, 1977, Ser. No. 812,544
Int. Cl.[2] H03B 19/00
U.S. Cl. 328—16 6 Claims



1. Apparatus for producing a low-noise frequency-stable microwave signal comprising:

a low-noise frequency-stable VHF signal generator providing a first signal having a frequency f_x;

first amplifier means having a first amplifier input and a first amplifier output, said first amplifier input connected to said signal generator, and providing signal gain in the VHF range to said first signal;

first frequency multiplier means having a first multiplier input and a first multiplier output, said first multiplier input connected to said first amplifier output, said multiplier means generating a second signal harmonically related to f_x;

second amplifier means having a second amplifier input and a second amplifier output, said second amplifier input connected to said first multiplier output, and providing signal gain to said second signal;

second frequency multiplier means having a second multiplier input and a second multiplier output, said second multiplier input connected to said second amplifier output,

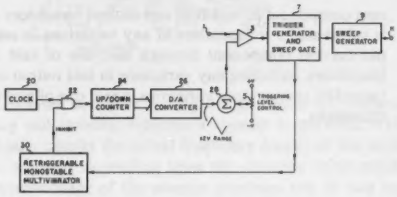
said second multiplier means generating a signal of frequency Nf_r, where N is a predetermined integer and Nf_r is in the microwave frequency range; and

a microwave bandpass filter connected to said second multiplier output, having a passband centered about Nf_r, and producing a microwave frequency signal having a total noise content less than what would be produced by an otherwise equivalent amplifier-frequency-multiplier combination interconnected between said VHF signal generator and said microwave bandpass filter.

4,121,164
AUTOMATIC TRIGGER CIRCUIT

Dennis LeRoy Feucht, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 27, 1977, Ser. No. 791,271
Int. Cl.² H03K *4/08*
U.S. Cl. 328—181 **3 Claims**



1. An automatic trigger circuit, comprising:

a signal input;

a variable reference voltage source for providing a variably adjustable voltage level within a predetermined triggering voltage window;

a comparator having a first input terminal coupled to said signal input and a second input terminal coupled to said reference voltage source, said comparator generating triggering signals in response to a comparison between said signal input and said variably adjustable voltage level;

scanning means for causing said reference voltage automatically to scan through said triggering voltage window, said scanning means including means for generating a triangular voltage waveform the peak-to-peak amplitude of which is at least twice the peak-to-peak amplitude of said triggering voltage window, said scanning means further including means for summing said triangular voltage waveform with said variably adjustable voltage level to provide a scanning reference voltage; and

control means for disabling said scanning means for a predetermined period of time after a triggering signal is generated.

4,121,165
DIGITAL DEMODULATOR WITH INTERPOLATION FOR LINEARLY AMPLITUDE-MODULATED DATA SIGNALS

Renato Dogliotti; Umberto Mazzei, both of Turin, and Umberto Mengali, Pisa, all of Italy, assignors to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Apr. 22, 1977, Ser. No. 790,081
Claims priority, application Italy, Apr. 22, 1976, 67962 A/76
Int. Cl.² H03D *1/02*; H03K *9/02*
U.S. Cl. 329—50 **5 Claims**

1. A digital demodulator of data signals of a given symbol frequency transmitted by linear amplitude modulation of a carrier, comprising:

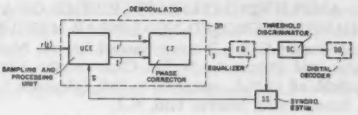
a source of first, second and third clock pulses, said first clock pulses having a cadence higher than said symbol frequency but not harmonically related thereto, said second and third clock pulses having a cadence equal to said symbol frequency while being relatively staggered by half a cycle of their cadence;

analog/digital conversion means connected to said source for deriving a series of digitized samples from an incoming modulated carrier at the cadence of said first clock pulses;

delay means connected to said conversion means and controlled by said first clock pulses for simultaneously presenting a multiplicity of successively received digitized samples on respective outputs thereof;

first and second memory means respectively storing first and second sets of interpolation coefficients which are functions of the carrier frequency, said first and second memory means having enabling inputs connected to said source for respectively receiving said second and third clock pulses therefrom;

a generator of address signals controlled by said first and second clock pulses, said generator being connected to said



first and second memory means for reading out a multiplicity of first interpolation coefficients from said first memory means in the presence of a second clock pulse and for reading out a multiplicity of second interpolation coefficients from said second memory means in the presence of a third clock pulse;

digital filter means with first and second inputs respectively connected to said first and second memory means and with other inputs connected to the outputs of said delay means for deriving from said digitized samples and from said first and second interpolation coefficients two interleaved trains of in-phase samples and quadrature samples;

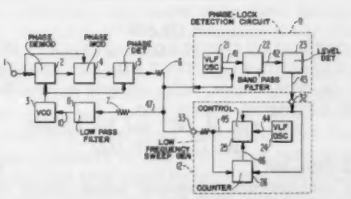
phase-correcting means connected to said digital filter means for recovering a phase-coherent baseband signal from said in-phase and quadrature samples; and

synchronization-estimating means downstream of said phase-correcting means feeding back an error signal to said source for establishing an optimum relative time position of said first, second and third clock pulses.

4,121,166
PHASE SYNCHRONIZING CIRCUIT FOR DEMODULATION OF MULTI-PHASE PSK SIGNALS

Youichi Matsumoto, and Yoshimi Tagashira, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Nov. 11, 1977, Ser. No. 850,518
Claims priority, application Japan, Nov. 11, 1976, 51-136044
Int. Cl.² H03D *3/02*
U.S. Cl. 329—122 **5 Claims**



1. In a phase synchronizing circuit for the demodulation of multi-phase PSK signals comprising a phase synchronizing loop, including a voltage controlled oscillator for generating a variable frequency output in response to a control voltage and a phase comparator for providing a comparison output representative of the phase difference between the output of said voltage controlled oscillator and an input signal, said compari-

son output serving as said control voltage, the improvement wherein said phase synchronizing circuit further comprises:

phase synchronization detector means connected to said phase synchronizing loop for detecting the phase-synchronized and unsynchronized states of said loop;

low frequency oscillator means connected to receive the output of said phase synchronizing detector means for generating a predetermined variable-amplitude voltage supplied as a frequency sweep voltage for said voltage controlled oscillator during a period of time, said period of time running from the detection at said detector of the phase-unsynchronized state to a predetermined period of time after the detection of the change from the phase-unsynchronized state to the synchronized state; and

means for supplying the output of said low frequency oscillator to said phase synchronizing loop.

4,121,167

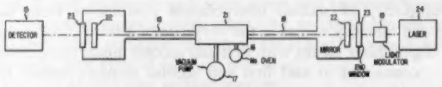
AMPLIFYING CHARACTERISTICS OF A CAVITY-ENCLOSED NONLINEAR MEDIUM

Hyatt McDonald Gibbs, Warren; Samuel Leverte McCall, Jr., Gillette, and Thirumalai Nallan Chakravarthy Venkatesan, Plainfield, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 27, 1976, Ser. No. 735,989

Int. Cl.[2] H01S *3/00*

U.S. Cl. 330—4.3 **66 Claims**



1. A method of amplifying variations in an optical signal of a given wavelength comprising:

introducing light of the given wavelength into a cavity formed by at least two surfaces that reflect light of the given wavelength, and which surfaces are separated at least in part by a positive-temperature nonlinear medium;

fixing the cavity and medium characteristics such that the dispersive properties of the medium dominate or are equal to the absorptive properties of the medium at the given wavelength and such that there is a single valued relationship between the intensities of the incident and transmitted signals which exhibits gain; and

extracting the amplified signal from said cavity, the invention characterized in that

the dispersive properties of the medium are made to dominate its absorptive properties by inducing transitions within the material through the absorption of light, which transitions introduce dispersive contributions due to non-driven states, which contributions are greater than 10 percent of the dispersive contributions due to the driven states.

4,121,168

OPTICALLY COUPLED BIAS CIRCUIT FOR COMPLEMENTARY OUTPUT CIRCUIT AND METHOD

Robert M. Stitt, Tucson, Ariz., assignor to Burr-Brown Research Corporation, Tucson, Ariz.

Filed Aug. 24, 1977, Ser. No. 827,212

Int. Cl.[2] H03F *3/21*

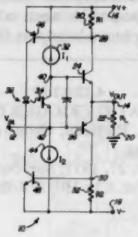
U.S. Cl. 330—265 **15 Claims**

1. A complementary transistor output circuit having an output and an input and comprising:

(a) a first output transistor of a first conductivity type having first and second electrodes and a control electrode;

(b) a second output transistor of a second conductivity type having first and second electrodes and a control electrode, said first electrode of said first transistor being coupled to said first electrode of said second transistor and being also coupled to said output, said input being coupled to said control electrode of both said first and second transistors; and

(c) means electrically responsive to an output current component through one of said output transistors and coupling said first and second control electrodes for biasing said first and second output transistors to produce a bias current component in said first and second transistors which is substantially independent of any variations in said output current component through said one of said output transistors, including any variations in said output current caused by temperature variations in said one of said output transistors.



4,121,169

AMPLIFIER DEVICE

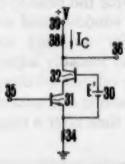
Masayuki Iwamatsu, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Jan. 13, 1977, Ser. No. 759,123

Claims priority, application Japan, Jan. 19, 1976, 51-3373[U]

Int. Cl.[2] H03F *3/04*

U.S. Cl. 330—296 **14 Claims**



1. In an amplifier device of the type comprising first and second cascode connected three electrode active semiconductor elements each having a control electrode, a majority carrier input electrode and a majority carrier output electrode and wherein the control electrode of the first element is connected to a signal input terminal, the majority carrier input electrode of the first element is connected to a source of reference potential through resistance means, the majority carrier output electrode of the first element is connected to the majority carrier input electrode of the second element, and the majority carrier output electrode of the second element is connected to a voltage source via a resistor and to an output terminal, the improvement wherein the control electrode of said second element is connected back to the majority carrier input electrode of said first element through a constant current biasing circuit means without intervening impedance means.

4,121,170
TUNABLE OSCILLATOR WITH HIGH STABILITY AND ACCURATE FREQUENCY

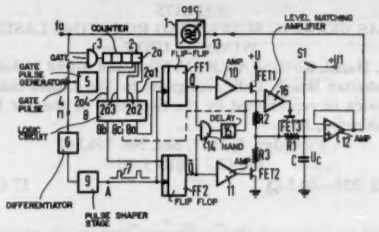
Heribert Hartmann, Hohenbrunn Riemerling, and Guenter Wess, Seefeld, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jul. 22, 1977, Ser. No. 818,088

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1976, 2641501

Int. Cl.[2] H03B 3/04

U.S. Cl. 331—1 A **11 Claims**



1. A tunable oscillator having a high degree of frequency accuracy and stability, wherein a counter is provided which periodically checks the actual frequency output of the oscillator and wherein, depending upon the counting value reached in the lowest stage of the counter produces one of two logic signals and the first signal is formed on the occurrence of a number which deviates in a first, correlated number sequence which indicates a frequency deviation from the theoretical value in a first direction, and the second signal is formed on the occurrence of a number which deviates in a second correlated number sequence which indicates a frequence deviation from the theoretical value in the opposite direction, and wherein said logic signals are used to recharge a capacitor, whose charging voltage represents a regulating voltage which reduces the frequency drift of said oscillator, characterized in that a recharging circuit for said capacitor (C) contains a switch (FET3), which is actuated on the repeated occurrence of indentical or differing numerical values directly in series in one of the number sequences, and causes the charging- or discharging- constant to switch to a lower value.

4,121,171
FILTERING CIRCUIT FOR A PHASE-LOCKED LOOP

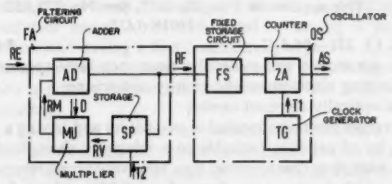
Gero Schollmeier, Gauting, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 12, 1977, Ser. No. 814,900

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1976, 2631937

Int. Cl.[2] H03B 3/04

U.S. Cl. 331—1 A **3 Claims**



1. A phase-locked loop receiving an input signal and generating an output signal comprising:

a phase detector means coupled to said input and output signals for detecting the phase difference between said input and output signals, said phase detector means producing a phase detecting control signal having instantaneous values depending upon said phase difference;

an oscillator coupled to said phase detector for generating said output signal;

a filtering circuit, receiving said phase detecting control signal, for producing a filtered control signal, whereby said filtered control signal is applied to said oscillator to vary the repetition rate of said output signal as a function of the instantaneous value of said filtered control signal;

wherein the filtering circuit further comprises: an adder circuit having first and second inputs, wherein said phase detecting control signal is applied to said first input and said filtered control signal is supplied at an output of said adder;

a storage circuit means connected to said adder output for producing a storage circuit output signal which represents the filtered control signal delayed by a period of said phase detecting control signal; and

a multiplier means coupled to said storage circuit means for producing a multiplier output signal which represents the storage circuit output signal multiplied by a constant factor which is less than unity, wherein the multiplier output signal is applied to the second input of said adder.

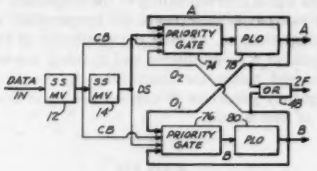
4,121,172
DUAL LOOP PHASE LOCKED OSCILLATOR SYSTEM

Lawrence Garde, Bloomington, Minn., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Nov. 14, 1977, Ser. No. 850,885

Int. Cl.[2] H03B 3/04

U.S. Cl. 331—1 A **16 Claims**

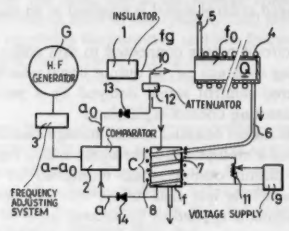


1. A phase locked oscillator system for producing output pulse signals at a frequency locked to an input data rate, comprising: first gate means for producing a first latch signal consisting of a plurality of pulses; second gate means for producing a second latch signal consisting of a plurality of pulses; first phase locked oscillator means responsive to said first latch signal for producing a first output pulse signal having a frequency representative of the pulse frequency of said first latch signal; second phase locked oscillator means responsive to said second latch signal for producing a second output pulse signal having a frequency representative of the pulse frequency of said second latch signal; input circuit means responsive to input data for producing a first input pulse signal; said first gate means being responsive to said first output pulse signal for producing said first latch signal having a first binary value and selectively responsive to said first input pulse signal and said second output pulse signal for producing said first latch signal having a second binary value; and said second gate means being responsive to said second output pulse signal for producing said second latch signal having a first binary value and selectively responsive to said first input pulse signal and said first output pulse signal for producing said second latch signal having a second binary value.

4,121,173
ARRANGEMENT FOR AUTOMATICALLY CONTROLLING THE FREQUENCY OF A HYPERFREQUENCY GENERATOR FEEDING A RESONANT ELEMENT SUBJECTED TO FLUCTUATIONS IN TEMPERATURE

Guy Azam; André Bensussan, and Claude Levaillant, all of Buc, France, assignors to CGR-MeV, Buc, France

Filed Feb. 14, 1977, Ser. No. 768,370
Claims priority, application France, Feb. 17, 1976, 76 04347
Int. Cl.[2] H03B *3/04*
U.S. Cl. 331—9 5 Claims

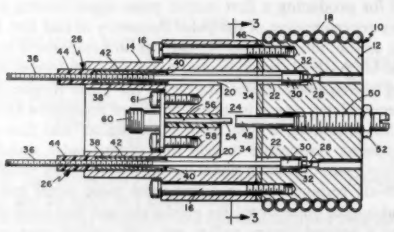


1. An arrangement for automatically controlling the frequency of a hyperfrequency generator feeding a resonant element of which the frequency varies with the temperature of its walls, said resonant element being cooled by means of a cooling fluid, said arrangement comprising at least one reference resonant cavity tuned to a frequency $f = f_o - \Delta f$, f_0 being the non-operating frequency of the resonant element, said reference cavity being associated with means allowing the circulation of said cooling fluid along the walls of said reference cavity, said reference cavity being associated with a heat supply, for bringing it at any given moment t, to a temperature substantially equal to that of said resonant element, means being provided for measuring the amplitude variation $\Delta a = a - a_o$ of the signal corresponding to the frequency variation of said reference cavity in terms of the temperature variation of said resonant element, a being the amplitude of the resonant cavity signal at a given instant and a_0 being the initial signal amplitude, and means for controlling the frequency of said hyperfrequency generator in dependence upon the amplitude variation of said signal.

4,121,174
ADJUSTABLE MICROWAVE POWER COMBINER FOR PLURALITY OF COAXIAL CIRCUITS

Richard Aston, Claremont, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Oct. 31, 1977, Ser. No. 846,965
Int. Cl.[2] H03B *7/14*
U.S. Cl. 331—48 16 Claims



1. A microwave power combiner comprising in combination:

a plurality of co-axial circuits, each having a longitudinal axis and a solid state microwave diode at one end of the axis and a tapered adjustable attenuator at the other end thereof, an impedance transformer connected to said diode and an elongated conductor element extending from said transformer through said attenuator,

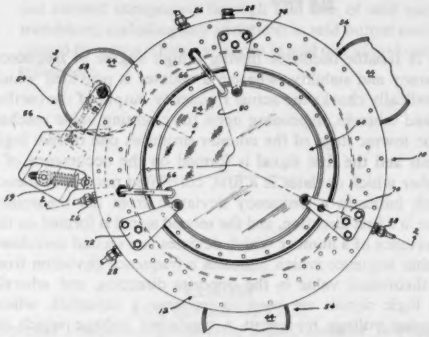
housing means defining an adjustable resonator cavity, said plurality of circuits mounted in said housing means surrounding said cavity,

an output port centrally disposed in said cavity with respect to said circuits for receiving the combined outputs from said circuits.

4,121,175
GAS BEARING SUSPENDED ROTATING LASER WINDOW UNIT

Roy A. Hamil, Kirtland A.F.B., N. Mex., and Alfred L. Johnson, Manhattan Beach, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 5, 1977, Ser. No. 756,942
Int. Cl.[2] H01S *3/02*
U.S. Cl. 331—94.5 D 17 Claims



1. A laser window unit comprising a supporting structure, means for transmitting a beam of radiation focused thereupon, a gas bearing, said gas bearing rotatably suspending said radiation transmitting means within said supporting structure, means for providing a motive force to said radiation transmitting means thereby causing the rotational movement thereof within said supporting structure and means for cooling said radiation transmitting means during the rotational movement thereof.

4,121,176
ATOMIC AND MOLECULAR RESONANCE LASER

David E. Golden, 3810 Stockwell, Lincoln, Nebr. 68506, and Stephan M. Ormonde, P.O. Box 8575, Albuquerque, N. Mex. 87108

Continuation of Ser. No. 586,690, Jun. 13, 1975, abandoned.
This application Feb. 22, 1977, Ser. No. 771,052
Int. Cl.[2] H01S *3/22*
U.S. Cl. 331—94.5 G 8 Claims

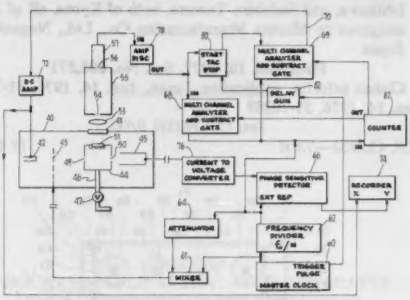
1. An atomic and molecular resonance laser apparatus for generating electromagnetic energy comprising:

an optically resonant cavity;

a target substance located in said cavity and having a plurality of particles excitable to a relatively short-lived resonant state characterized by a relatively broad resonance of width in the range from about 0.25 to about 5eV and having an upper and lower energy state to which individual particles decay from said resonant state, the rate of decay to said upper state being greater than the rate of decay to said lower state, said particles being capable of transition from said upper to said lower energy states to generate said electromagnetic energy, the mean lifetime of

said upper and said lower states being greater than the mean lifetime of said resonant state; and

means for exciting said individual particles to said relatively short-lived resonant state at a rate greater than the rate of decay of said particles from said resonant state to produce a population inversion between said upper and lower



energy states, said exciting means including an electron beam generator for generating an electron beam having a predetermined energy distribution centered about said resonance characterizing said resonant state with a width no greater than substantially the width of said resonance, and means for directing said electron beam onto said target substance.

4,121,177
SEMICONDUCTOR DEVICE AND A METHOD OF FABRICATING THE SAME

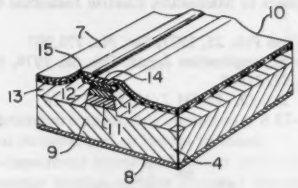
Toshihisa Tsukada, Sekimachi, Japan, assignor to Hitachi, Ltd., Japan

Continuation-in-part of Ser. No. 474,023, May 28, 1974, abandoned. This application Oct. 31, 1975, Ser. No. 627,863

Claims priority, application Japan, May 28, 1973, 48-58643; May 28, 1973, 48-58644; Mar. 4, 1974, 49-24261

Int. Cl.[2] H01S *3/19*; H01L *21/208*

U.S. Cl. 331—94.5 H **14 Claims**



1. A semiconductor device comprising:

a semiconductor body consisting of a III-V compound semiconductor material not including Al, having a major surface, and having a first conductivity type;

a mesa-shaped multi-layered semiconductor crystal disposed upon a portion of the major surface of said body and including

(i) a laser active layer having two opposite surfaces, a first surface of which faces towards the major surface of said body and a second surface of which faces away from the major surface of said body, a pair of said surfaces and a pair of end surfaces,

(ii) an upper semiconductor layer of a second conductivity type, opposite to said first conductivity type, being a top layer of said mesa-shaped multi-layered semiconductor crystal, consisting of a material including Al and having a broader band gap than that of the material of said laser active layer, and disposed on the second surface of said laser active layer, and

(iii) a lower semiconductor layer of said first conductivity type, consisting of a material different from and having a broader band gap than that of the material of said laser active layer, and disposed on the first surface of said laser active layer;

a side semiconductor layer of said first conductivity type consisting of a material different from and having a broader band gap than that of the material of said laser active layer, and disposed on the remainder of said major surface of said body and contiguous with the laser active layer at the side surfaces thereof but not the top surface of said mesa-shaped multi-layered semiconductor crystal; and

first and second layers disposed on said semiconductor body and said upper semiconductor layer, respectively.

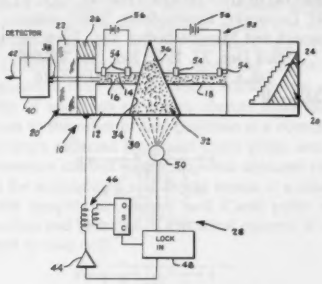
4,121,178
LASER CAPABLE OF PRODUCING A FREQUENCY STANDARD

Howard R. Schlossberg, Lexington, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 5, 1976, Ser. No. 734,842

Int. Cl.[2] H01S *3/13, 3/23*

U.S. Cl. 331—94.5 G **8 Claims**

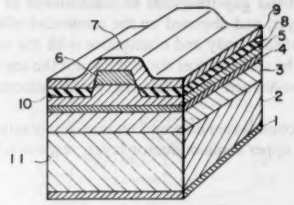


1. A laser capable of producing a stable frequency standard comprising means for containing a pair of different active materials, a pair of active materials located in said containing means, said containing means being configured so as to allow high pressure operation to take place therein, each of said pair of active materials being gaseous and maintained in said containing means under said high pressure, said active materials having close but non-overlapping gain profiles, a resonator enclosing said containing means, means for activating said active materials thereby producing an output in the form of two laser frequencies, means for containing an absorbing gas, an absorbing gas located within said absorbing gas containing means, said absorbing gas having an absorption profile which is overlapped by one of said laser frequencies, means operably connected to said resonator for locking said overlapping laser frequency to the center of said absorption profile of said absorbing gas and means for detecting said two laser frequencies and producing a single output at the difference frequency between said two laser frequencies.

4,121,179
SEMICONDUCTOR INJECTION LASER

Naoki Chinone, Kokubunji; Toshihiro Kawano, Hachioji, and Hisao Nakajima, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 3, 1977, Ser. No. 755,994
Claims priority, application Japan, Jan. 12, 1976, 51-2072
Int. Cl.[2] H01S 3/19
U.S. Cl. 331—94.5 H 4 Claims

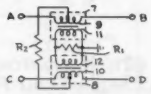


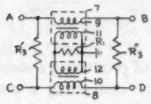
1. In a semiconductor injection laser device including at least one of a p-layer and an n-layer, respectively contiguous to upper and lower surfaces of an active lasing layer, said p-layer and said n-layer being a semicondutor material which has an energy band gap greater than that of the active lasing layer, and electrodes being respectively provided on a semiconductor on the p-layer side and on a semiconductor on the n-layer side, said semiconductor injection laser device comprising that one of said p-layer and said n-layer contiguous to said upper and lower surfaces of said active layer is made of a semiconductor material which has a stripe mesa portion, and which has a base part extending under and out of said stripe mesa portion, said base part being 0.8μ to 1.5μ thick.

4,121,180
BROADBAND DIRECTIONAL COUPLER

Thomas H. Greenway, Londonderry, N.H., assignor to Technical Research and Manufacturing, Inc., Manchester, N.H.

Filed Dec. 27, 1976, Ser. No. 753,987
Int. Cl.[2] H01P 5/12, 5/18, 5/16
U.S. Cl. 333—10 10 Claims





1. A directional coupler having four terminals A, B, C and D comprising,

(a) a first transformer having a primary circuit and a secondary circuit referred to herein as the first primary and first secondary circuits, respectively,

(b) a second transformer having a primary circuit and a secondary circuit referred to herein as the second primary and second secondary circuits, respectively,

(c) said first primary circuit providing terminals A and B, and

(d) said second primary circuit providing terminals C and D,

(e) secondary circuit resistive impedance means connected in parallel with said first and second secondary circuits,

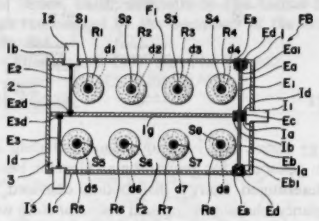
(f) primary circuit resistive impedance means connecting said first and second primary circuits, and

(g) whereby a frequency input signal at A appears at B and C in substantially the same phase and is substantially isolated from D.

4,121,181
ELECTRICAL BRANCHING FILTER

Toshio Nishikawa, Nagaokakyo; Yoji Ito, Takatsuki; Youhei Ishikawa, and Sadahiro Tamura, both of Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Jun. 10, 1977, Ser. No. 805,571
Claims priority, application Japan, Jun. 14, 1976, 51-70258; Jun. 14, 1976, 51-70259
Int. Cl.[2] H03H 9/00
U.S. Cl. 333—73 R 11 Claims

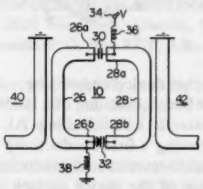


1. An electrical branching filter for use in electrical and electronic equipment which comprises a first dielectric filter and a second dielectric filter each having, in housing means of metallic material, exciting means, exciting rod member and at least one dielectric resonator means disposed between said exciting means and said exciting rod member, said exciting rod member for said first and second dielectric filters being connected to connecting means so as to form coupling means, with input and output being applied to and developed from said connecting means at intermediate portion between said exciting rod members and one end of each of said exciting means.

4,121,182
ELECTRICAL TUNING CIRCUIT

Mitsuo Makimoto, and Sadahiko Yamashita, both of Kawasaki, Japan, assignors to Matsushita Electric Industrial Co., Limited, Japan

Filed Feb. 25, 1977, Ser. No. 771,987
Claims priority, application Japan, Feb. 26, 1976, 51/21502; Feb. 26, 1976, 51/21503
Int. Cl.[2] H03H 7/10; H03J 3/18
U.S. Cl. 333—73 S 15 Claims



1. An electronic tuning circuit comprising a transmission line having a first section only reactively coupled with an input circuit and a second section only reactively coupled with an output circuit, a voltage-controlled capacitor having first and second terminals respectively having connections to said first and second sections to form with said sections a closed-loop resonant circuit, first and second RF choke coils respectively connected to said first and second terminals of said voltage-controlled capacitor to supply a DC control potential between said first and second terminals, and a DC blocking capacitor

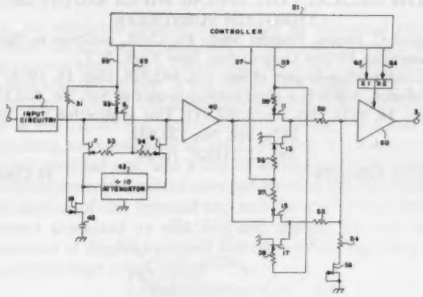
having a low impedance to a radio-frequency current and electrically connected in said resonance circuit to prevent said DC control potential from being supplied to second terminal of said voltage-controlled capacitor.

4,121,183

PROGRAMMABLE ATTENUATOR APPARATUS EMPLOYING ACTIVE FET SWITCHING

Desmond Lewis Murphy, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 29, 1976, Ser. No. 736,929
Int. Cl.[2] H03H 7/26
U.S. Cl. 333—81 R **6 Claims**



1. An attenuator apparatus, comprising:

an input terminal and an output terminal;

a high-impedance attenuator section and a low-impedance attenuator section serially disposed between said input terminal and said output terminal, said attenuator sections including impedance means;

a buffer amplifier interposed between said high-impedance attenuator section and said low-impedance attenuator section; and

programmable switch means including a plurality of field-effect transistors for selecting said impedance means to provide selectable attenuator networks having predetermined attenuation values;

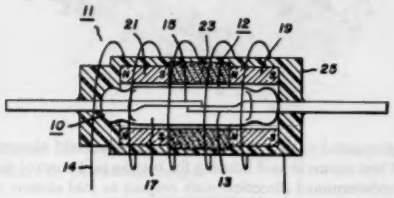
said high-impedance attenuator section including a hybrid attenuator device having a predetermined attenuation value serially disposed between a pair of field-effect transistors, said high-impedance attenuator section further including a bypass field-effect transistor in parallel with the serial combination of said hybrid attenuator device and said pair of field-effect transistors, said field-effect transistors being adapted to be selectively switched on and off to provide a selectable signal path therethrough.

4,121,184

ELECTROMAGNETICALLY CONTROLLED, TEMPERATURE-SENSITIVE (ECTS) REED SWITCH WITH SUBSTANTIALLY HYSTERSIS FREE OPERATION

Leonard R. Dinkler, Gainesville, and Jerry Herrin, Alachua, both of Fla., assignors to General Electric Company, Gainesville, Fla.

Continuation-in-part of Ser. No. 623,780, Oct. 20, 1975. This application Dec. 27, 1976, Ser. No. 754,196
Int. Cl.[2] H01H 9/54, 51/28
U.S. Cl. 335—179 **6 Claims**



1. An electrically operable low hysteresis switching device comprising:

(a) a reed switch having a pair of electrical contacts;

(b) permanent magnetic means disposed adjacent said reed switch for establishing a magnetic field in the vicinity of the reed switch contacts;

(c) ferrite means, disposed adjacent to said reed switch and said permanent magnetic means, for normally altering said magnetic field at ferrite temperatures equal to the Curie point of said ferrite, thereby to cause said reed switch normally to assume first and second switch positions at ferrite temperatures below and above said Curie point, respectively, under the influence of said magnetic field;

(d) an electromagnetic coil means disposed adjacent said reed switch, permanent magnetic means and said ferrite means and in magnetic circuit therewith, said coil having input terminals for supplying electrical current to alter said magnetic field by an amount sufficient to cause the position of said reed switch to change from one of said positions to the other of said positions at a constant ferrite temperature different from said Curie point; and

(e) temperature control means disposed adjacent said ferrite means for maintaining said ferrite means at a substantially constant temperature below said Curie point upon the application and removal of electrical current at the input terminal to said coil.

4,121,185

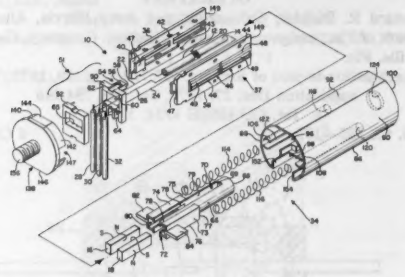
LINEAR POSITION SENSOR

Earl James Genz, Des Plaines, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jul. 18, 1977, Ser. No. 816,552
Int. Cl.[2] H01F 21/06
U.S. Cl. 336—110 **12 Claims**

1. A linear position sensor comprising a pair of elongated magnetically affected sensing means, each having an elongated axis, a generally rectangular-shaped support means which supports said sensing means so that said axes are aligned with each other, a pair of elongated permanent magnets, an elongated control means which holds said magnets, said control means having a centrally located slot that runs part way therethrough in the direction of its elongated dimension and said support means is received therein so that opposite magnetic poles of said magnets face each other and said sensing means are received intermediate said poles and adjacent thereto, said control means further comprising a sensing end that extends from said control means at the end of said slot in said control member, a housing which receives said support means and said

control means therein so that said control means is movable relative to said support means, having a closure wall with an aperture therein through which said sensing end projects and



an elongated side wall which extends from said closure wall, and bias means in said housing for biasing said control means in a predetermined direction with respect to said closure wall.

4,121,186

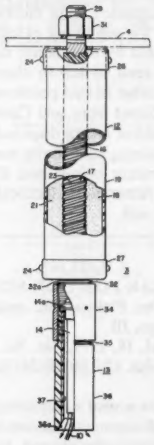
INDICATING SECTIONAL COMPOSITE FUSE CONSTRUCTION USING STANDARD-TYPE FUSE LINK

James N. Santilli, Bloomington, Ind., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 633,189, Nov. 19, 1975, abandoned, which is a continuation of Ser. No. 519,724, Oct. 31, 1974, abandoned, which is a continuation of Ser. No. 67,183, Aug. 26, 1970, abandoned. This application Oct. 6, 1976, Ser. No. 730,097

Int. Cl.[2] H01H *85/04*

U.S. Cl. 337—161 29 Claims



1. An indicating-type fusible device comprising a first high-current current-limiting section and a second relatively low-current expulsion section mechanically connected together in electrical series relation, the second relatively low-current expulsion section accommodating a standard-type fuse link, which may readily be replaced following fusing of the second relatively low-current expulsion section whereby changeable minimum-melt fuse characteristics are possible, and said first and second fusible sections remaining electrically and mechanically interconnected following any type of fuse rupture.

4,121,187

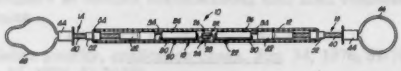
HIGH SPEED RATIO, DUAL FUSE LINK

William R. Mahieu, Centralia, Mo., assignor to A. B. Chance Company, Centralia, Mo.

Filed Jun. 21, 1977, Ser. No. 808,656

Int. Cl.[2] H01H *71/10, 71/20*

U.S. Cl. 337—171 21 Claims



1. A dual element, high speed ratio fuse link including:

a pair of spaced conductors,

a solder junction intermediate said conductors;

a pair of heat-generating fusible elements each extending from said junction to a respective one of said conductors;

at least one of said elements having a non-linear stretch comprising a series of arcuate segments connected end-to-end; and

a thermal-insulative member disposed along the length of said non-linear stretch in substantially surrounding engagement with the latter for providing structural support to said one element and for more efficient heat transfer from said one element to said solder junction thereby causing melting of the junction at lower current values.

4,121,188

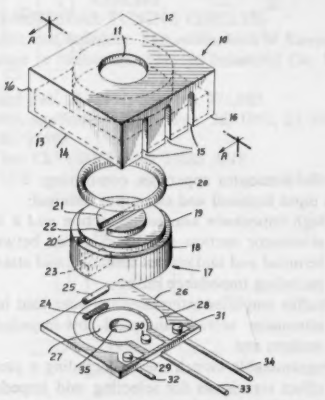
CLOSED FRAME SINGLE TURN POTENTIOMETER WITH HELICAL COIL SPRING WIPER ADJUSTABLE THROUGH SUBSTRATE

Randall C. Ragan, Rancho Santa Fe, Calif., assignor to North American Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 642,328, Dec. 19, 1975, abandoned, which is a continuation-in-part of Ser. No. 452,130, Mar. 18, 1974, Pat. No. 3,964,011. This application Sep. 16, 1976, Ser. No. 723,932

Int. Cl.[2] H01C *10/34*

U.S. Cl. 338—174 14 Claims



1. A single turn variable resistance device comprising:

a ceramic substrate having a central collector ring and an arcuate resistance element;

a housing having a front wall and side walls, said front wall having an opening therein; the inner portion of said housing having a first interior wall portion for receiving said substrate, a second interior wall portion surrounding said opening in said front wall, and a third interior wall portion intermediate said first and said second interior wall portions,

a rotor in said housing having side walls engaging said third

interior wall portion of said housing as a bearing surface, and including a helical coil spring wiper facing said substrate for making electrical contact between said collector ring and said resistance element, and a cylindrical resilient support contacting said wiper for biasing said wiper against said substrate; and

means mechanically holding said substrate and said rotor in said housing.

4,121,189

ELECTRICAL RESISTOR AND METHOD OF MAKING SAME

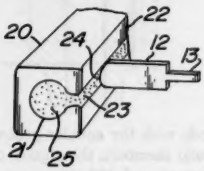
Karl-Heinz Kuhl, Tornesch; Eberhard Muranka, Hamburg; Bernhard Schulz, Kl. Nordende, and Asmund Tielens, Pinneberg, all of Fed. Rep. of Germany, assignors to TRW Inc., Cleveland, Ohio

Filed Mar. 8, 1977, Ser. No. 775,723

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1976, 2613677

Int. Cl.[2] H01C *1/02*

U.S. Cl. 338—226 **17 Claims**



1. An electrical resistor comprising an elongated resistor element having end sections and a resistance material extending therebetween, and a connecting part which is pressed onto at least one end section of the resistor for being bonded with the resistor element, the connecting part comprising a terminal lug of electrically conductive material having a first end section along and contacting an end of the resistor element and a second terminal end, and a cap of mechanically firm, easily workable material received over and securing together the first end section of the terminal lug and the end of the resistor element contacted by said first end section, the cap being composed of deep-drawn steel and the terminal lug being of a high-percentage copper alloy.

4,121,190

METHOD OF AND APPARATUS FOR SONAR DETECTION AND THE LIKE WITH PLURAL SUBSTANTIALLY ORTHOGONAL RADIATION BEAMS

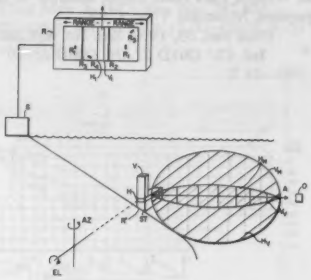
Harold Eugene Edgerton, Cambridge; Charles W. Wyckoff, Needham, both of Mass., and Robert Harvey Rines, Concord, N.H., assignors to The Academy of Applied Science, Inc., Boston, Mass.

Filed Jul. 20, 1976, Ser. No. 707,051

Int. Cl.[2] G01S *9/68, 7/56*

U.S. Cl. 340—3 R **18 Claims**

1. A method of sonar location and the like, that comprises, transmitting and receiving sonar energy in a fan-shaped acoustic beam along a predetermined axis underwater from a predetermined location, the beam having a narrow beam angle in one plane and a relatively wide beam angle in a substantially orthogonal plane, to provide wide-angle echo-detection in the orthogonal plane with narrow-angle discrimination in the said one plane; substantially simultaneously transmitting and receiving sonar energy in a further fan-shaped acoustic beam substantially along said axis underwater from substantially the same location, said further beam having a narrow beam angle in the said orthogonal plane and a relatively wide beam angle in the said one plane, to enable wide-angle echo-discrimination in the said one plane with narrow-angle discrimination in the said orthogonal plane; simultaneously displaying the received echo signals of both beams; and indicating when an echo signal is displayed from both beams at precisely the same range, thus



to pin-point the position of the echoing objects as directly along said axis and at said range.

4,121,191

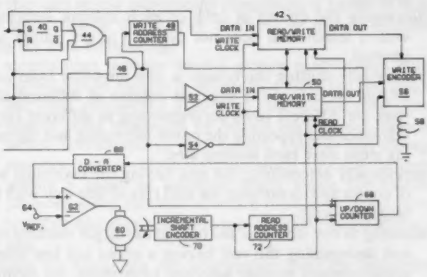
SEISMIC DATA TAPE RECORDING SYSTEM

David P. Corkhill, St. Albans, England, assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 5, 1976, Ser. No. 673,329

Int. Cl.[2] G01V *1/40*

U.S. Cl. 340—15.5 DP **4 Claims**



1. In a seismic data recording system of the class wherein analog electrical signals are generated by a seismometer in response to acoustic waves in the earth, said electrical signals are sequentially converted to digital words at a fixed rate of conversions per second, and said digital words are coupled to a magnetic tape recorder to be written onto magnetic tape, the improvement comprising the combination of:

gating means having an input for receiving a digital word and a data output for providing the digital word one bit at a time, beginning with the most significant bit and ending with the least significant bit;

bit comparator means coupled to said gating means output for detecting the first bit which has a value of "1" and for coupling that bit and all lower value bits to an output;

a data buffer memory coupled to the bit comparator output for storing the bits coupled to the comparator output;

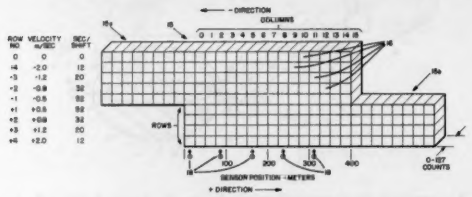
a variable speed magnetic tape recorder coupled to said buffer memory for writing the bits stored in the buffer memory onto magnetic tape at an essentially constant bits per inch rate; and

control means coupled to the buffer memory and said variable speed tape recorder for controlling the speed of said variable speed tape recorder in response to the difference between the number of bits written into said buffer memory and the number written on said magnetic tape.

4,121,192
SYSTEM AND METHOD FOR DETERMINING POSITION AND VELOCITY OF AN INTRUDER FROM AN ARRAY OF SENSORS

Dennis L. Wilson, Palo Alto, Calif., assignor to GTE Sylvania Incorporated, Mountain View, Calif.

Filed Jan. 31, 1974, Ser. No. 438,268
Int. Cl.[2] G01D *21/04;* G08B *13/00*
U.S. Cl. 340—16 R 12 Claims



1. A method of automatically determining velocity and direction of movement of target passing an array of sensors, comprising the steps of

spacing said sensors at predetermined distances along an area under surveillance,

operatively connecting said sensors to correspondingly spaced columns of a plurality of data storage cells arranged in a matrix comprising said columns and transverse rows of said cells,

increasing the counts in the cells of each column associated with a sensor that detects a target within a predetermined interval,

decreasing the counts in cells of each column associated with a sensor that does not detect a target within said interval,

periodically shifting the counts in one direction from each cell to the cell in the adjacent column at different shift rates for different rows corresponding to different target velocities and repeating the count increasing and decreasing steps after each shifting step,

periodically determining the row having the maximum sum of counts and identifying the shift rate of that row with the target velocity,

scanning in one direction the cells in the target velocity row and determining the cell having a count not less than a predetermined number whereby to establish the location of the target relative to the sensor array.

4,121,193
KELLY AND KELLY COCK ASSEMBLY FOR HARD-WIRED TELEMETRY SYSTEM

Early B. Denison, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 23, 1977, Ser. No. 809,259
Int. Cl.[2] G01V *1/40;* H01R *3/04*
U.S. Cl. 340—18 CM 8 Claims

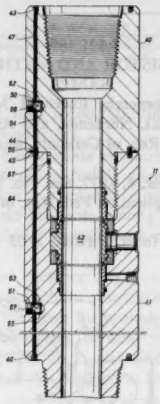
1. A kelly cock for use with a drill string that includes a hard-wired telemetering system, said telemetering system terminating at the upper end of the drill string in an annular contact ring disposed in the sealing shoulder of the tool joint on said drill string; said kelly cock comprising:

first and second tubular members, said first tubular member having a pin joint at one end and said second tubular member having a box joint at one end, the other ends of said first and second tubular members having parallel non-sealing shoulders, said first and second tubular members being joined together; a valve means, said valve means being disposed between said first and second tubular members and held in place when said first and second tubular members are jointed together;

an annular groove formed in the sealing shoulder of both the pin end of said one tubular member the box end of said second tubular member and both of said parallel non-sealing shoulders;

a plurality of contact rigns, one of said contact rings being disposed in each annular groove of each of said tubular members, each of said contact rings having a pigtail;

a passageway formed in the wall of said first and second tubular members, said passageway communicating at



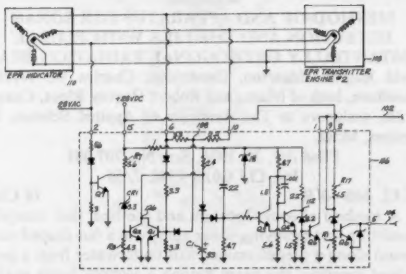
opposite ends with the annular grooves in said first and second tubular members, the pigtails of each contact ring extruding into one of said passageway; and

a port opening formed in each of said tubular members, said ports communicating with the passageways formed in said tubular members and removable means for closing said ports whereby said pigtails may be connected adjacent said ports and replaced in said passageways.

4,121,194
TAKE-OFF WARNING SYSTEM FOR AIRCRAFT

Thomas James Downey, Seattle; Peter Dennis Turnbull, Renton, and James Walter Gayther, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1976, Ser. No. 728,357
Int. Cl.[2] G08B *29/00*
U.S. Cl. 340—27 R 6 Claims



1. In combination in a multi-engine jet transport:

first means associated with a first engine for providing first signals representative of the thrust of said first engine;

second means associated with a second engine for providing second signals representative of the trust of said second engine;

logic controlled take-off warning circuit means for providing warning signals in the event one or more logical conditions required for take-off configuration of the aircraft are not satisfied;

first signal generating means including a phase detection circuit responsive to said first signals for providing third signals representative of thrust levels referenced to a predetermined value equal to or less than required for take-off of said multi-engine jet transport but greater than required for other ground operations of said multi-engine jet transport;

second signal generating means including a phase detection circuit responsive to said second signals for providing fourth signals representative of thrust levels referenced to said predetermined value;

circuit means responsive to said third and fourth signals for enabling said logic controlled take-off warning circuit to develop warning signals when said third and fourth signals are both representative of thrust levels exceeding said predetermined value and one or more of said logical conditions required for take-off configuration of the aircraft is not satisfied; and said circuit means including thrust reverser sensing circuit means for preventing nuisance warnings in said logic controlled take-off warning circuit means at high levels of reverse thrust.

4,121,195

ERROR DETECTION IN DIGITAL SYSTEMS

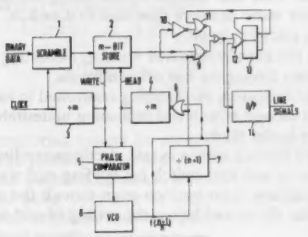
Anthony Jessop, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed May 19, 1977, Ser. No. 798,504

Claims priority, application United Kingdom, Jun. 2, 1976, 22849/76

Int. Cl.[2] **G06F** *11/10;* **G08C** *25/00*

U.S. Cl. 340—146.1 AB **4 Claims**



1. An error detecting arrangement for a digital transmission line system over which constant accumulated disparity signals are transmitted comprising:

a transmitter including

first means for modifying the line signals at intervals to introduce into the line signals control signals the digital values of which reflect the parity of predetermined digital signal events in the immediately preceding intervals, said control signals themselves having values which maintain the overall constant accumulated disparity of transmitted signals; and

a subsequent point in the system including

second means coupled to said first means, said second means responding to said predetermined digital signal events in said transmitted signals, and

third means coupled to said second means, said third means determining a change in the d.c. content of the output of said second means.

4,121,196

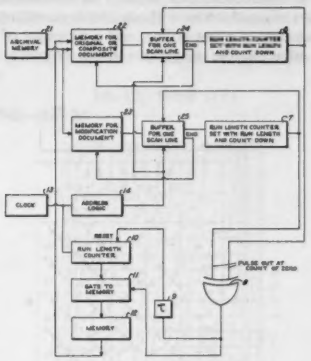
DATA BASE UPDATE SCHEME

Richard N. Johnson, and Marvin J. Schneider, both of Adelphi, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 2, 1977, Ser. No. 792,832

Int. Cl.[2] **G02B** *5/00;* **G03B** *21/14;* **G06K** *9/00*

U.S. Cl. 340—146.3 P **4 Claims**


ARCHIVAL MEMORY
MEMORY FOR MODIFICATION DOCUMENT
BUFFER FOR ONE SCAN LINE
RUN LENGTH COUNTER SET WITH RUN LENGTH AND COUNT DOWN
MEMORY FOR MODIFICATION DOCUMENT
BUFFER FOR ONE SCAN LINE
RUN LENGTH COUNTER SET WITH RUN LENGTH AND COUNT DOWN
CLOCK
ARCHIVAL LOGIC
RESET
RUN LENGTH COUNTER
GATE TO MEMORY
MEMORY
PULSE OUT AT COUNT OF ZERO

1. An apparatus for modifying the contents of a storage memory which stores original picture information which is encoded in the memory in accordance with the run length encoding compaction algorithm, said picture information being delineated by picture line in said memory, for each picture line said stored information comprising a group of numbers which locate the relative positions of picture elements along the line, comprising,

a modification memory having picture modification information stored therein in accordance with the run length encoding compaction algorithm, said modification information being delineated by picture lines in said memory which correspond to said picture lines in said storage memory, said modification information for each line comprising a group of numbers which locate the relative positions along that line at which picture elements are to be either added or deleted to said original picture information,

means for extracting the information from the respective memories on a line by line basis,

means responsive to said information extracted for modifying the group of numbers stored in said storage memory for each line by 1) adding numbers which are indicative of positions along that line at which the numbers in said storage memory do not locate a picture element but the numbers in said modification means do locate a picture element, and, 2) deleting numbers which are indicative of positions at which both the numbers in said storage memory and the numbers in said modification memory locate picture elements.

4,121,197

MATRIX CIRCUIT FOR AN ELECTROSTATIC RECORDING DEVICE COMPRISING CROSS-POINT ELEMENTS FOR DRIVING EACH PAIR OF CONTROL ELECTRODES ON A COMMON MATRIX CONDUCTOR

Takashi Ogawa, and Kazunori Kimura, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

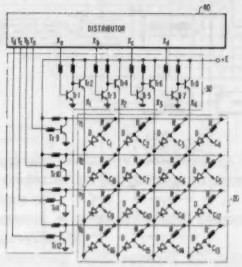
Filed Mar. 4, 1977, Ser. No. 774,563

Int. Cl.[2] **H04G** *5/00*

U.S. Cl. 340—166 R **4 Claims**

1. In a matrix circuit to be used in an electrostatic recording device comprising a multiplicity of aligned stylus electrodes and a sequence of control electrodes along said stylus electrodes for cyclically driving said control electrodes at succes-

sive time slots, with two consecutive control electrodes in said sequence driven at each of said time slots and with one of the two consecutive control electrodes next following in said sequence the other of the two consecutive control electrodes continuously driven at the next succeeding time slot together with the control electrode next following in said sequence said one of the two consecutive control electrodes, said matrix circuit comprising a plurality of conductors of a first set, a plurality of conductors of a second set successively crossing said first set of conductors without ohmic contact therewith to form a plurality of cross points, and a plurality of cross-point elements adjacent the respective cross points in one-to-one



correspondence with said control electrodes, each of said cross-point elements bridging one each of said first and second set of conductors crossing at one of said cross points adjacent to said each cross-point element, said matrix circuit further comprising means for supplying selection signals selectively to said first and second set of conductors to select a pair of said cross-point elements at each of said time slots, said cross-point elements driving the corresponding control electrodes when selected, the improvement wherein all of said cross-point elements to be selected in pair are arranged to bridge one of the conductors of one of said first and second sets and two respective ones of the conductors of the other of said sets.

4,121,198

REMOTE CONTROL SYSTEM

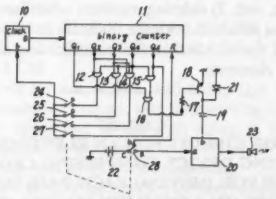
Yoshikazu Tsuboi, Takatsuki, and Yoshitomo Uzu, Suita, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 6, 1976, Ser. No. 747,988

Claims priority, application Japan, Dec. 17, 1975, 50-151024; Dec. 29, 1975, 50-158817; Jan. 20, 1976, 51-5618; Feb. 13, 1976, 51-15022

Int. Cl.[2] H04Q *9/10*; H04B *1/06*

U.S. Cl. 340—171 R **7 Claims**



1. A remote control system including a transmitter and a receiver,

said transmitter comprising a means for transmitting controlling signals corresponding to selected control functions, each of said controlling signals containing first frequency portions disposed in time sequences in accordance with a pulse code modulation, second frequency portions disposed to fill time spaces between parts of said first frequency, a last second frequency part disposed immediately to follow the coded first frequency part and a control retention signal part of the first frequency disposed after said last second frequency part, length of time of said retention signal part being controlled by means of a switch for controlling analog means; and

said receiver comprising a means to decode said controlling signal to produce output signals corresponding to said selected items and a means to control said output signal in a manner to continue for the retention signal part.

4,121,199

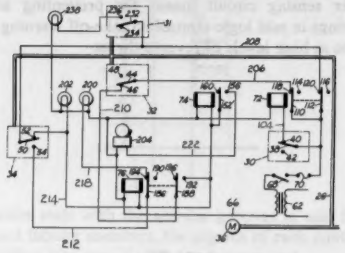
SENTINEL SYSTEM FOR GREASE EXTRACTING VENTILATORS

Hurshel F. Young, 20280 SW. Jaylee St., Aloha, Oreg. 97005

Continuation of Ser. No. 611,238, Sep. 8, 1975, abandoned. This application Sep. 8, 1976, Ser. No. 721,517

Int. Cl.[2] G08B *21/00*

U.S. Cl. 340—611 **9 Claims**



1. A sentinel system for sensing fluid pressure in a stack of the type having a fan developing static pressure, said system comprising,

(a) first and second pressure operated switches,

(b) means arranged to connect said switches in communication with the interior of said stack,

(c) said two switches having different static operating pressures with said second switch being set to operate at a lower static pressure than said first switch,

(d) an electric circuit,

(e) an electrically operated warning indicating means in said circuit having on and off conditions,

(f) said indicating means being controlled in its operation by said second switch and indicating undesirable static pressure in the stack,

(g) and holding means in said circuit controlled in its operation by said first switch for holding said warning indicating means in on position even though the static pressure varies above and below the setting of said second switch.

4,121,200

SWIMMING POOL ALARM SYSTEM

Gustavo T. Colmenero, 2624 Walnut La., Plano, Tex. 75074

Filed Jul. 22, 1976, Ser. No. 707,670

Int. Cl.[2] G08B *13/16*

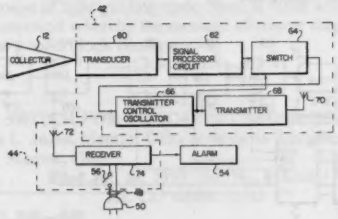
U.S. Cl. 340—539 **11 Claims**

1. Apparatus for monitoring a swimming pool comprising:

transducer means for converting ambient air pressure changes into electrical signals;

water displacement collector means positioned below the surface of the water in the pool and coupled to said transducer means for receiving water displacement information in said pool and transmitting said water displacement information to said transducer means, said water displacement collector means including a conduit having water of the pool in a lower portion thereof, and air in the portion of the conduit above the water, said portion with air being coupled to said transducer means and having sufficiently low air leakage to transmit, to the transducer means, air

pressure changes resulting from motion of water in the lower portion having frequencies in the 0.5 Hz to 5 Hz range;



detector means coupled to said transducer means for providing an output signal when said transducer means electrical signals are within a selected frequency range; and

utilization means for receiving and utilizing said output signal.

4,121,201

CARRIER CURRENT APPLIANCE THEFT ALARM

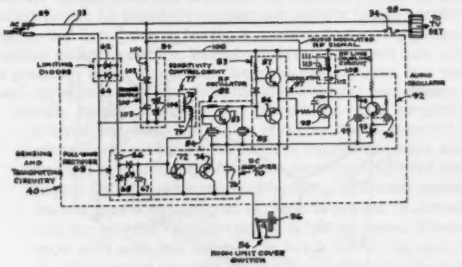
Paul Weathers, Haddon Heights, N.J., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Mar. 22, 1974, Ser. No. 454,033

The portion of the term of this patent subsequent to Sep. 17, 1994, has been disclaimed.

Int. Cl.[2] G08B *13/14*

U.S. Cl. 340—524 **18 Claims**



1. In a monitoring system for monitoring conditions occurring at a large plurality of remote locations,

sensing and transmitting means located at each remote location and being operative to sense the occurrence of an undesired condition and in response thereto to transmit a modulated signal,

a plurality of receiving means for receiving said modulated signals, each of said receiving means being operative to detect the modulation of a received signal and to produce a detected output signal corresponding thereto, and

monitoring means connected to said receiving means and responsive to said detected output signals said monitoring means including a frequency-sensitive indicating means for each remote location tuned to the corresponding modulating frequency thereof, for providing an indication of the corresponding remote location,

each of said sensing and transmitting means including an RF oscillator having a tuned reed vibrating system for generating a carrier signal, and an audio oscillator having a tuned vibrating reed system for generating a modulating signal, each of said receiving means including tuned input means having a vibrating reed system tuned to provide a flat-topped pass band, the pass band being centered at the respective carrier frequency and having sufficient bandwidth to accommodate the modulation components of the carrier signal, and each of said frequency-sensitive indicating means including a tuned input circuit having a vibrating reed system sharply tuned to the modulating frequency of its corresponding sensing and transmitting means.

4,121,202

DISPLAY DEVICE HAVING VISIBLE PATTERN

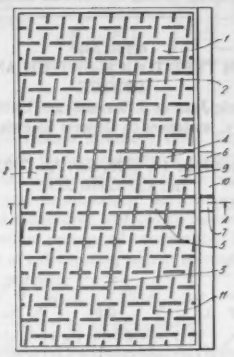
William James Mason Gissane, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 22, 1976, Ser. No. 735,123

Claims priority, application United Kingdom, Oct. 31, 1975, 45326/75

Int. Cl.[2] G06F *3/14*

U.S. Cl. 340—324 M **10 Claims**



1. A display device comprising at least a pair of electrodes chargeable to opposite polarities from each other, said electrodes having a first degree of contrast when charged and a different degree when not charged, said electrodes located relative to a background, and means for forming a regular visible pattern comprising insulating sections extending over at least a portion of the said electrodes and the background to reduce the discernability of said electrodes in one of said degrees of contrast, the said visible pattern maintaining electrical insulation between electrodes of different polarity from each other.

4,121,203

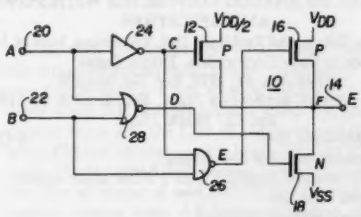
METHOD OF MULTIPLEXING LIQUID CRYSTAL DISPLAYS

Wales Dale Edwards, Satellite Beach, and William Harold White, Indialantic, both of Fla., assignors to Harris Corporation, Cleveland, Ohio

Filed Mar. 11, 1977, Ser. No. 776,818

Int. Cl.[2] G02F *1/13*; H03K *1/12*

U.S. Cl. 340—336 **4 Claims**



1. A circuit for alternating a data signal from between a first and second voltage level to between a second and third voltage level at an output comprising:

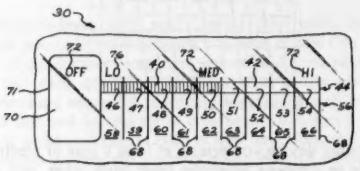
a data input,

an alternating signal input,
a first switch means for providing said first voltage level at said output,
a second switch means for providing said second voltage level at said output,
a third switch means for providing said third voltage level at said output,
an inverter means between said data input and said second switch means,
a NOR gate means for receiving said data and alternating signal inputs and producing an output coupled to said third switch means, and
a NAND gate means for receiving said alternating signal input and the output of said inverter and producing an output coopled to said first switch means.

4,121,204
BAR GRAPH TYPE TOUCH SWITCH AND DISPLAY DEVICE

Stanley B. Welch; Juan de J. Serrano, and David Y. Chen, all of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Dec. 14, 1976, Ser. No. 750,559
Int. Cl.[2] G08B 5/36
U.S. Cl. 340—337 **4 Claims**



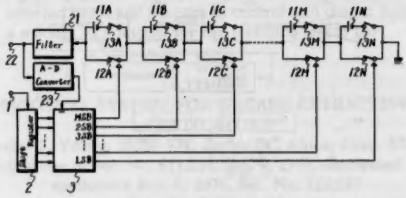
1. A touch switch and display device comprising:
a linear array of display segments strung out such that each segment is adjacent to no more than two other segments, said display segments adapted to be progressively energized to form a bar graph type display to represent a numerical quantity;
a linear array of light transmitting touch sensitive areas superimposed over said linear array of display segments; and
circuit means responsive to said touch sensitive areas and connected for energizing said display segments such that when any one of said touch sensitive areas is touched, a corresponding display segment and all display segments to one side are energized, and the remaining display segments are de-energized.

4,121,205
DIGITAL TO ANALOG CONVERTER WITH POWER AMPLIFICATION

Akira Iga, Tokyo, and Toshitada Doi, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 31, 1977, Ser. No. 764,526
Claims priority, application Japan, Feb. 6, 1976, 51-11905
Int. Cl.[2] H03K 13/05
U.S. Cl. 340—347 DA **8 Claims**

1. A power amplifier comprising:
an input terminal supplied with a PCM input signal;
an output terminal;
a reference voltage terminal;
plural power sources each having a voltage value weighted according to an order of bits of said PCM input signal;
plural switching circuit means controlled by said PCM input signal to connect said power sources selectively between said output terminal and said reference terminal in response to said PCM input signal to produce an analog output signal at said output terminal in response to said PCM input signal;
an analog-to-digital converter connected to said output terminal for converting said analog output signal to a digital signal; and

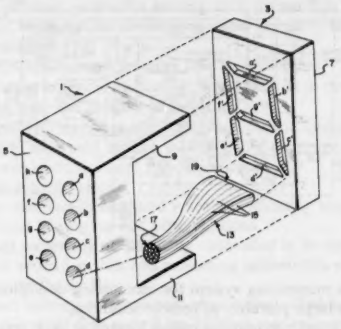


a digital subtraction circuit having inputs connected to said input terminal and said analog-to-digital converter and outputs connected to said plural switching circuit means for producing a feedback effect to compensate for losses due to resistance in said plural switching circuit means.

4,121,206
FIBER OPTIC MESSAGE CHARACTER DISPLAY DEVICE AND METHOD OF MAKING SAME

Paul R. LeMire, Yonkers, N.Y., assignor to Ackerman Bodnar Corporation, New Rochelle, N.Y.

Filed Jan. 14, 1977, Ser. No. 759,472
Int. Cl.[2] G02B 5/16; G08B 5/00
U.S. Cl. 340—380 **5 Claims**



1. A visual message character display device comprising, in combination:
(a) a light guide support member having
(i) a light receiving surface with a plurality of openings and
(ii) a visual message character display surface separate and spaced apart from the light receiving surface and having a plurality of bar-shaped openings arranged to provide arrays of a plurality of bar segments of predetermined visual message characters; and
(b) a plurality of groups of light guiding optic fibers disposed within the space between the light receiving and visual message character display surfaces of the light guide support member, each light guiding optic fiber having a light admitting end and light emitting end, said device being further characterized in that the light admitting ends of the fibers of each group of light guiding optic fibers are bundled together in one opening in and terminate at the light receiving surface thereby defining and occupying essentially the entire surface area of said opening, the light emitting ends of the fibers of each group of light guiding optic fibers are bundled together in one opening in and

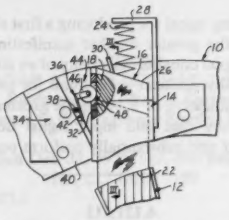
terminate at the visual message character display surface thereby defining and occupying essentially the entire surface area of a visual message character bar segment, and the space between the light receiving surface and the visual message character display surface containing the groups of light guiding optic fibers is filled with a potting compound whereby the message character display device has a solid block configuration.

4,121,207

SWITCH FOR INDICATING BRUSH WEAR

Francis L. Jones, Mentor, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Jul. 18, 1977, Ser. No. 816,633
Int. Cl.[2] G08B 21/00
U.S. Cl. 340—648 **8 Claims**



1. In a brush wear indicator for a machine having a rotating commutator, a yoke surrounding said commutator, a brush holder on said yoke and carbon brush means mounted on said brush holder for translatory movement relative to said commutator, said brush means having a contact face spring-pressed against said commutator, an end opposite the contact face, and a generally straight side interconnecting the contact face and end opposite the contact face, the improvement comprising:

switch means including arm means movable generally toward and away from the brush means to determine respective closed and open states of the switch means, and resilient spring means operatively connected with the arm means, for urging the arm means toward the brush means, the arm means including an arm means portion in contact with the generally straight side of the brush means, whereupon with sufficient wear of the brush means, the end of the brush means opposite the contact face reaches the arm means portion in contact with the generally straight side of the brush means, allowing the resilient spring means to move the arm means to provide a closed state of the switch means.

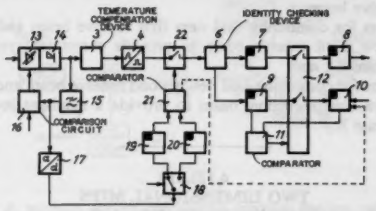
4,121,208

DEVICE FOR INCREASING THE SAFETY WITH RESPECT TO TRANSMISSION FAULTS IN AN INFORMATION TRANSMISSION SYSTEM

Friedbert Becker; Wilhelm Grafinger, both of Munich, and Bernhard Hildebrandt, Hochbrück, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 11, 1977, Ser. No. 776,766
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1976, 2612968
Int. Cl.[2] G01S 9/56
U.S. Cl. 343—6.5 R **8 Claims**

1. In a device for increasing security with respect to transmission faults in an information-transmission system, particularly for the railroad field, in which an interrogation device and a passive response device are movable relative to one another; the interrogation device transmitting an interrogation signal, which can be periodically swept through a predetermined frequency band, preferably in the microwave range; the interrogation device receiving, during a read operation of at least two periods from the passive response device, a frequency-selectively reflected interrogation signal, in accordance with a k-digit information item to be transmitted; the combination of means for amplifying such a reflected interrogation signal received by the interrogation device; means for monitoring the level of the low-frequency portions of such a reflected interrogation signal lying below the sweep frequency of the interrogation device and for reducing the amplification of said amplifying means if the level of such low frequency portions



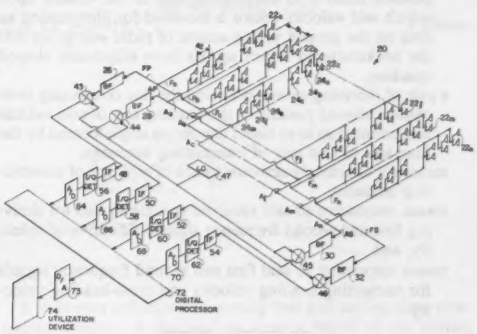
reaches a predetermined threshold value, whereby such low frequency portions do not undesirably exceed such threshold value; switch means for controlling the through-connection of the response signal to subsequent devices; and control means connecting said monitoring and switch means, for controlling the latter to prevent passage of a transmitted information item in the presence of a decreasing and/or increasing level of such low frequency portion.

4,121,209

TWO-AXIS MOTION COMPENSATION FOR AMTI

Tomos L. ap Rhys, Ellicott City, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 20, 1977, Ser. No. 843,905
Int. Cl.[2] G01S 9/42, 9/02
U.S. Cl. 343—7.7 **11 Claims**



1. An antenna system for use with a pulse-type airborne moving-target-indication radar system comprising:

means for producing a first receive beam FP, a second receive beam AP, a third receive beam FS, and a fourth receive beam AS, the lines of center of said first receive beam FP, said second receive beam AP, said third receive beam FS, and said fourth receive beam AS being parallel, the lines of center of said first receive beam FP and said second receive beam AP being coincident, the lines of center of said third receive beam FS and said fourth receive beam AS being coincident, the lines of center of said first receive beam FP and said second receive beam AP being separated from the lines of center of said third receive beam FS and said fourth receive beam AS, the phase center of said first receive beam FP being forward of the

phase center of said second receive beam AP, and the phase center of said third receive beam FS being forward of the phase center of said fourth receive beam AS:

means for varying the phase centers of said first receive beam FP and said second receive beam AP to effectively provide a new first receive beam and a new second receive beam;

means for varying the phase centers of said third receive beam FS and said fourth receive beam AS to effectively provide a new third receive beam and a new fourth receive beam;

means for combining said new first receive beam and said new third receive beam to provide a resultant receive beam R_2; and

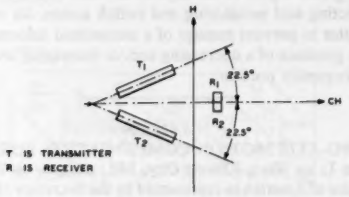
means for combining said new second receive beam and said new fourth receive beam to provide a resultant receive beam R_1.

4,121,210

TWO DIMENSIONAL MIPS

Lester Irving Goldfischer, New Rochelle, N.Y., assignor to The Singer Company, Little Falls, N.J.

Filed Jun. 29, 1977, Ser. No. 811,109
Int. Cl.² G01S 9/46
U.S. Cl. 343—8 **7 Claims**



5. A velocity sensor comprising:

a pair of transmitting antennas mounted in a predetermined position relative to the heading axis of the vehicle upon which said velocity sensor is mounted for illuminating an area on the ground with a source of radar energy so that the backscattered return signals have elliptically shaped speckles,

a pair of receiving antennas having the line connecting their centers aligned parallel to the heading axis of said vehicle and oriented so as to bisect the obtuse angle formed by the long axis of said pair of transmitting antennas,

means for alternately activating each of said pair of transmitting antennas,

means responsive to said received speckle signals for deriving first and second frequency signals indicative of velocity, and

means responsive to said first and second frequency signals for computing heading velocity and cross-heading velocity.

4,121,211

METHOD AND APPARATUS FOR DETERMINING A SIGNAL OF UNIFORM PERIOD

Joseph Martin Cusack, Plainsboro, N.J., assignor to RCA Corporation, New York, N.Y.

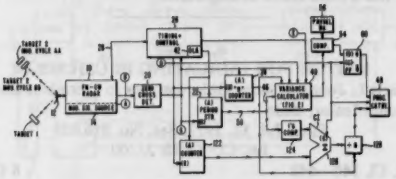
Filed Aug. 5, 1977, Ser. No. 822,210
Claims priority, application United Kingdom, Nov. 22, 1976, 48630/76; Jul. 26, 1977, 31377/77
Int. Cl.² G01S 9/24
U.S. Cl. 343—14 **6 Claims**

1. Apparatus responsive to any input alternating signal having at least N periods to determine whether said signal has portions consisting essentially of an alternating signal of substantially uniform period, where N is an integer greater than one, comprising in combination:

means responsive to said input signal for determining the values, X_i corresponding respectively to the lengths of said periods where $i = 1, 2, \ldots N$;

means for determining a value, Y, corresponding to the variance of the N values of X_i; and

means comparing said value Y with a preselected value Z representing the maximum variance of said uniform period alternating signal for producing a first signal indicative of Z being the greater number manifesting thereby that said input signal consists essentially of an alternating signal of substantially uniform period and for producing a second signal indicative of Y being the greater number manifesting thereby that said input signal does not consist essentially of said substantially uniform period signal.

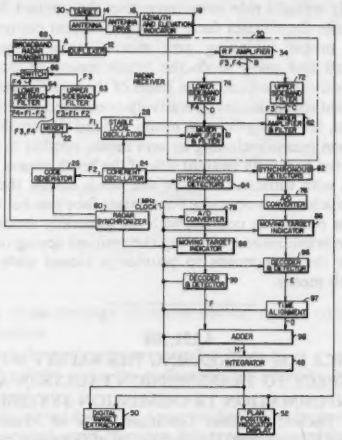


4,121,212

DOUBLE SIDEBAND PULSE RADAR

John W. Taylor, Jr., Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 634,210, Nov. 21, 1975, abandoned. This application Oct. 3, 1977, Ser. No. 838,697
Int. Cl.² G01S 7/28
U.S. Cl. 343—17.1 R **25 Claims**



21. A method for operating a pulse radar system comprising the steps of:

transmitting spaced apart radar pulses of length T, said pulses being composed of a first component having a frequency F3 and a second component having a frequency F4,

receiving target reflected pulses between said spaced apart radar pulses and processing said pulses,

said frequencies F3 and F4 differing by an amount which causes the relative phase of the target reflected pulses reflected from significant scattering sources on a desired target over a range extent ΔR to differ by at least 360°,

said step of transmitting includes transmitting said first and

second components of said radar pulse sequentially in time,

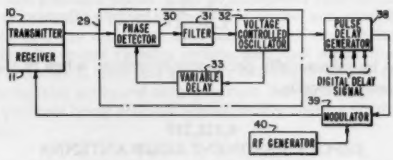
said step of processing said pulses includes the steps of detecting targets in each of said first and second components of said radar pulse, time aligning the outputs of said detecting means, and mathematically combining the time aligned outputs of said step of detecting targets, and wherein

said step of transmitting radar pulses include the steps of transmitting with a single transmitter of sufficient bandwidth for radiating said pulses, generating a first frequency signal, generating a second frequency signal, and mixing said first and second frequency signals to generate said frequencies F3 and F4.

4,121,213
RADAR ALTIMETER SIMULATOR

Louis W. Bush, Baltimore, and Allen R. Cumming, Towson, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 31, 1977, Ser. No. 846,944
Int. Cl.[2] G01S 7/40
U.S. Cl. 343—17.7 10 Claims



1. An altitude simulator comprising:

(a) a phase detector circuit having first and second input terminals and an output terminal, said first terminal being coupled to receive a trigger signal;

(b) a voltage controlled oscillator circuit having an input terminal and an output terminal, the input terminal of said voltage controlled oscillator circuit being coupled to the output terminal of said phase detector circuit such that the output frequency of said oscillator circuit is a function of the output voltage of said phase detector circuit;

(c) first delay means having an input and an output terminal, said input terminal being coupled to receive as an input the output signal of said voltage controlled oscillator to generate a signal having the same frequency as the output signal of said voltage controlled oscillator but delayed therefrom by a time interval determined by said first delay means, said delayed signal being coupled to said second input of said phase detector circuit to complete a phase locked loop;

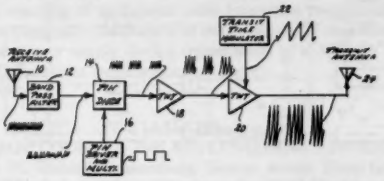
(d) pulse delay generator means having at least one input terminal and at least one output terminal, said input terminal being coupled to receive as an input signal the output signal of said voltage controlled oscillator and producing at said output terminal a signal having the same frequency as the output signal of said voltage controlled oscillator but delayed therefrom a predetermined time interval;

(e) a modulator circuit having first and second input terminals and an output terminal, said first and second input terminals being respectively coupled to receive the output signal of said pulse delay generator means and the output signal of an RF generator to produce at said output terminal of said modulator circuit a pulse modulated RF signal.

4,121,214
PROXIMITY FUZE JAMMER

Richard E. Marinaccio, Crofton, and Ward M. Meier, Ellicott City, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 16, 1969, Ser. No. 889,868
Int. Cl.[2] G01S 7/38; H04K 3/00
U.S. Cl. 343—18 E 2 Claims

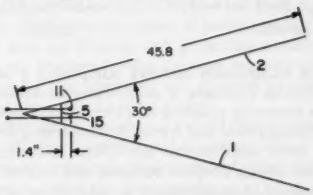


1. A method for predetonating missiles having proximity fuzes which radiate and receive electromagnetic energy comprising the steps of: receiving the electromagnetic radiation radiating from a fuze at a distance beyond the missile's effective warhead range; filtering the received signal to limit the signal to the fuze carrier and its modulated sidebands; square wave modulating the filtered signal; amplifying the modulated signal a first time; amplifying the modulated signal a second time, linearly varying the phase of the second amplified signal, and retransmitting the signal to the fuze at a distance beyond the missile's effective warhead range.

4,121,215
CORNER REFLECTOR ANTENNA FOR DF AND TRACKING APPLICATIONS

Normand Barbano, Sunnyvale, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 4, 1972, Ser. No. 278,493
Int. Cl.[2] H01Q 15/18
U.S. Cl. 343—18 C 3 Claims



1. A corner reflector comprising first and second sides connected together at one end to form a throat of the corner reflector; a reflector plate mounted to said first and second sides near said throat and parallel to a line formed by the junction of said first and second sides to each other; and at least first and second dipoles mounted in front of the reflector plate.

4,121,216
DIRECTION FINDER ANTENNA AND SYSTEM

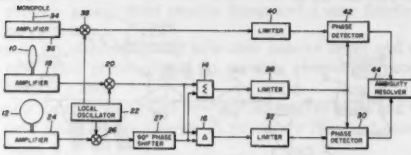
Carroll S. Bunch, Dallas, Tex.; Jerry L. Perry, Huntsville, Ala., and Robert L. Marcucci, San Jose, Calif., assignors to E-Systems, Inc., Dallas, Tex.

Filed Feb. 18, 1972, Ser. No. 227,544
Int. Cl.[2] G01S 5/02, 5/04
U.S. Cl. 343—113 R 11 Claims

1. A system for determining the location of a source of emitting radiation with respect to an energy receiving antenna having two orthogonally mounted directional antennas, a

nondirectional antenna, and means responsive to the signals from the directional antennas to generate sum and difference signals and to one of the directional antennas and the nondirectional antenna to generate a coarse direction signal, the improvement comprising:

a first phase detector responsive to the sum signal and the difference signal displaced by 90 electrical degrees from the sum signal for generating a quadrature related voltage;



a second phase detector responsive to sum and difference signals to generate an inphase reference voltage;

means responsive to the quadrature voltage and the inphase reference voltage to generate a multiple of the bearing angle to the emitting source; and

means responsive to the multiple of the bearing angle signal and the coarse direction signal for generating a bearing angle signal.

4,121,217

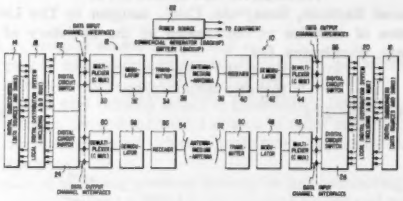
DATA TRANSMISSION NETWORK INTERFACE UNIT

Frank T. Chen, Reston, Va., assignor to Southern Pacific Communications Company (SPCC), Burlingame, Calif.

Filed Aug. 6, 1976, Ser. No. 712,154

Int. Cl.[2] H04J 3/00

U.S. Cl. 343—204 **13 Claims**



9. A data transmission network comprising a plurality of local distribution channels, a microwawe backbone trunk, a multiplexer hierarchy coupling said local distribution channels to said backbone trunk, said hierarchy comprising first, second and third level combination multiplexer/demultiplexers, a time division switch coupled between said second and third level multiplexer/demultiplexers, at least some of said local distribution channels including modems, an interface unit coupling said modem channels to said first level multiplexer/demultiplexer, said interface unit comprising a channel logic circuit for each modem channel and a common logic circuit for all said modem channels coupled to said channel logic circuits, and a supervisory input/output module coupling said common logic circuit to said first level multiplexer/demultiplexer.

4,121,218

ADJUSTABLE ANTENNA ARRANGEMENT FOR A PORTABLE RADIO

James Stuart Irwin, Ft. Lauderdale, and Francis Robert Steel, Parkland, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 3, 1977, Ser. No. 821,453

Int. Cl.[2] H01Q 1/24, 9/00, 1/36

U.S. Cl. 343—702 **9 Claims**

1. An antenna arrangement as for a hand-held transceiver and comprising in combination:

a helical antenna means mounted on the transceiver and coupled to be driven by the circuitry of the transceiver; and

an extendable half-wave antenna means, mounted on the transceiver and adapted to be capacitively coupled to said helical antenna means when in the extended position and

to be substantially decoupled therefrom when in the retracted position.

4,121,219

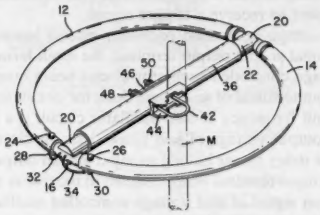
DIPOLE RESONENT LOOP ANTENNA

Gerald O'Connor, 1711 19th Ave. SE., Puyallup, Wash. 98371

Continuation-in-part of Ser. No. 675,791, Apr. 12, 1976, abandoned. This application May 5, 1977, Ser. No. 793,927

Int. Cl.[2] H01Q 9/26

U.S. Cl. 343—741 **3 Claims**



1. A half-wave dipole resonant loop antenna, comprising:

a pair of semi-circular, spaced apart, quarter-wave antenna elements;

a pair of generally T-shaped insulative couplers each of which has a pair of opposed legs extending away from each other and a center leg projecting perpendicularly away from said opposed legs, each of said opposed legs being secured to respective antenna elements with said center legs extending toward each other such that said elements curve away from each other in a generally circular configuration;

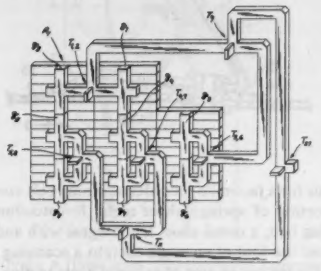
an upstanding, elongated, electrically conductive support mast; and

an electrically non-conductive elongated boom positioned diametrically within said circular configuration, said boom having its ends secured to the respective center legs of said couplers and its mid-portion secured to said support mast.

4,121,220
FLAT RADAR ANTENNA EMPLOYING CIRCULAR ARRAY OF SLOTTED WAVEGUIDES

Antoine Scillieri, Houilles, and Alain Caillaud, St.-Germain-En-Laye, both of France, assignors to Electronique Marcel Dassault, Paris, France

Continuation-in-part of Ser. No. 651,787, Jan. 23, 1976, abandoned. This application Feb. 2, 1977, Ser. No. 764,991
Claims priority, application France, Jan. 31, 1975, 75 03132
Int. Cl.[2] H01Q *13/10*
U.S. Cl. 343—768 8 Claims

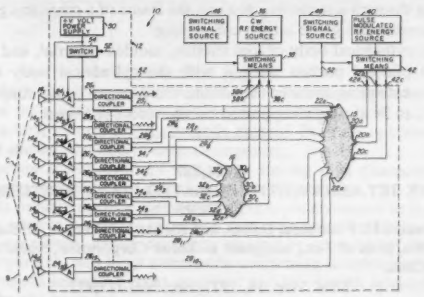


1. In a radar system including a transmit/receive unit of high-frequency waves, the combination therewith of an antenna comprising a planar array of juxtaposed radiators in the form of mutually parallel slotted waveguides, said array being divided into four quadrants each composed of a multiplicity of substantially square radiator groups, and feed means forming paths of identical electrical lengths extending from said unit to all the radiator groups of each quadrant, the radiator groups of each quadrant being arrayed symmetrically about a quadrantal bisector.

4,121,221
RADIO FREQUENCY ARRAY ANTENNA SYSTEM

Lee A. Meadows, Santa Barbara, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Mar. 14, 1977, Ser. No. 777,484
Int. Cl.[2] H01Q *3/26, 21/00*
U.S. Cl. 343—854 5 Claims

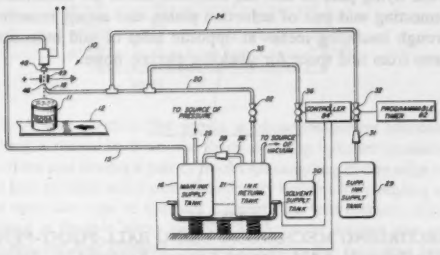


1. A multibeam array antenna comprising:
(a) an array of antenna elements;
(b) a first beam forming network coupled to each of the antenna elements in the array;
(c) a second beam forming network coupled to a portion of the antenna elements;
(d) a plurality of radio frequency amplifiers, each one of the antenna elements in the array being coupled to the first beam forming network through a corresponding one of such plurality of radio frequency amplifiers and each one of the antenna elements in the portion of the antenna elements being coupled to the second beam forming network through a corresponding one of the portion of the plurality of radio frequency amplifiers;
(e) means for coupling a power supply to the portion of the plurality of radio frequency amplifiers;
(f) switching means for coupling the remaining ones of the plurality of radio frequency amplifiers to the power supply selectively in accordance with a control signal such switching means including means for coupling the plurality of amplifiers to the power supply during transmission of one type of modulated radio frequency energy and for coupling only the portion of radio frequency amplifiers to the power supply during transmission of a different type of modulated radio frequency energy.

4,121,222
DROP COUNTER INK REPLENISHING SYSTEM

Joseph M. Diebold, Schaumburg; George Arway, River Grove, and Joseph James Stone, Northbrook, all of Ill., assignors to A. B. Dick Company, Chicago, Ill.

Filed Sep. 6, 1977, Ser. No. 830,636
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—75 11 Claims



1. In a drop writing system for projecting ink droplets toward a print target which has a main ink supply as the source for ink and in which certain of the droplets are selected to strike the print target while the remaining ink droplets are returned to the ink reservoir, the combination comprising:
(a) a print head connected to receive ink from the main ink supply and having an orifice of predetermined cross-sectional area for forming and projecting toward the print target ink droplets having a known quantity of ink;
(b) means for characterizing said droplets to select certain droplets to strike the print target;
(c) counting means responsive to said characterizing means for producing a count signal indicating that a number of droplets constituting a predetermined quantity of ink were selected to strike the print target;
(d) a supply of supplemental ink;
(e) flow control means responsive to said count signal for directing from said supplemental ink supply to the main ink supply a quantity of ink substantially equal to said predetermined quantity of ink.

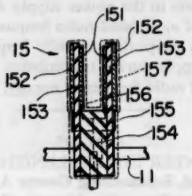
4,121,223
INK JET RECORDING APPARATUS WITH AN IMPROVED INK SENSOR

Hideyuki Omori; Osamubo Otubo, both of Ibaraki, and Yoshio Ohuchi, Hori, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 10, 1976, Ser. No. 722,031
Claims priority, application Japan, Sep. 19, 1975, 50-112609
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—75 11 Claims

1. In an ink jet recording apparatus having means for emitting a series of ink droplets with a constant interval, means for charging the ink droplets in accordance with electric signals including electric signals for detecting disorder in recording,

means for deflecting charged droplets in accordance with charges on the charged ink droplets, a recording medium, and sensor means disposed between the deflecting means and the recording medium for sensing the charges on the droplets for detecting disorder in recording and producing electric signals, the improvement on said sensor means comprising induction means including a pair of separated parallel induction plates



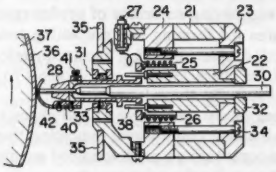
defining a space through which the ink droplets to be detected pass between in nonimpinging relation with the sensor means, said space having an open portion in a direction perpendicular to the flying path of said ink droplets, means for electrically connecting said pair of induction plates, and means mounted through insulating means at opposite sides of said induction plates from said space for shielding electric noise.

4,121,224

RECORDING MECHANISM USING BALL-POINT-PEN

Jikko Takeuchi, 6-434, Honcho 4-chome, Koganei-City, Tokyo, and Masaya Mizuno, 476-74, Hodokubo, Hino-City, Tokyo, both of Japan

Filed Feb. 9, 1977, Ser. No. 767,040
Int. Cl.[2] G01D *15/16*
U.S. Cl. 346—139 C **6 Claims**



1. A recording mechanism using a ball-point pen, comprising:

a shaft having a ball-point pen fixed in the center thereof and a movable coil wound around the outer periphery of said shaft;

a mechanism for supporting said shaft in a freely slidable manner such that said ball-point pen, said shaft and said movable coil are substantially free to move within a certain range in the axial direction of said pen;

an elastic strip fixed to said shaft, said strip projecting a little distance beyond the writing tip of said pen when said pen is at its free non-recording condition, and said strip contacting a recording paper concurrently with said pen at the recording condition; and

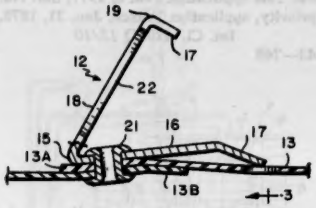
a gap having a uniform magnetic field in which said movable coil is set such that said coil moves in said axial direction with said shaft and said pen in said magnetic field when a varying electric current passes through said coil.

4,121,225

FACSIMILE RECORDING STYLUS

Kestutis E. Bliudnikas, North Grafton, Mass., assignor to Alden Research Foundation, Westboro, Mass.

Filed Mar. 14, 1977, Ser. No. 777,044
Int. Cl.[2] G01D *15/06*
U.S. Cl. 346—139 C **9 Claims**



1. A stylus for a facsimile recorder scanning belt comprising:

a foot portion of springy sheet metal for attachment to a scanning belt, a metal sheet leg integral with and extending from the foot at an angle thereto a scanning surface,

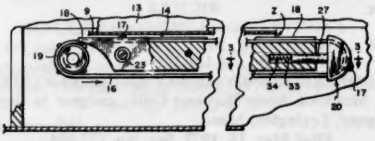
wherein the leg has an area of reduced cross section intermediate the foot and the scanning surface.

4,121,226

IDLER GUIDE FOR FACSIMILE SCANNING BELT

John M. Alden, Needham, Mass., assignor to Alden Research Foundation, Westboro, Mass.

Filed Mar. 25, 1977, Ser. No. 781,114
Int. Cl.[2] G01D *15/24*
U.S. Cl. 346—139 A **9 Claims**



1. Guide means for a stylus-supporting scanning belt orbitting through a recording zone on the frame of a graphic signal recorder, the guide means comprising:

a cylindrical body of low friction, molded material, and

a plunger portion integral with the cylindrical body and extending radially therefrom, the plunger being adapted to be slidingly supported on the recorder frame.

4,121,227

INK JET ARRAY WITH ISOLATED FLUID RECTIFIER LAYERS

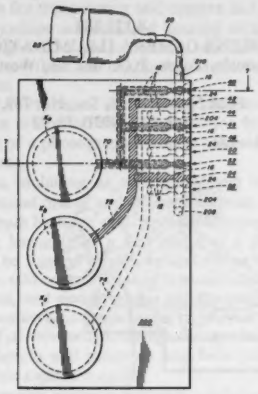
Kenneth H. Fischbeck, Dallas, and Richard H. Vernon, Richardson, both of Tex., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 14, 1977, Ser. No. 777,272
Int. Cl.[2] G01D *15/16*
U.S. Cl. 346—140 R **4 Claims**

1. A multiple ink jet assembly comprising:

a plurality of orifices arranged adjacent each other in a longitudinal array, inlet passage means for each jet adjacent a respective orifice, a fluid reservoir, fluid supply passage means communicated with said fluid reservoir and extending in a longitudinal direction across said jets, a plurality of fluid rectifier passage means spaced from one another and extending in a direction generally transverse to and communicating with said fluid supply passage means, each said fluid rectifier passage means being in

communication with a respective jet at a location between its respective orifice and a respective inlet passage means



to provide a fluid layer therebetween communicated to said reservoir.

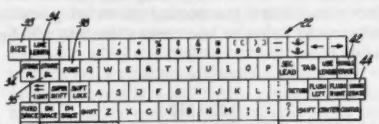
4,121,228
PHOTOCOMPOSITION MACHINE WITH KEYBOARD ENTRY AND CRT DISPLAY

Alan B. Cowe, Towpath Rd., Denville, N.J. 07834; Ronald A. Kubinak, 6 Tyroler Ct., Edison, N.J. 08817; George G. Pick, 23 Brockden Dr., Mendham, N.J. 07945; Richard M. Flanagan, 23 Sagamore Dr., Murray Hill, N.J. 07974, and Francis S. Szabo, 605 Lindsley Arms, Morristown, N.J. 07960

Continuation of Ser. No. 613,161, Sep. 15, 1975, abandoned, which is a continuation of Ser. No. 523,558, Nov. 14, 1974, abandoned. This application Apr. 14, 1977, Ser. No. 787,727

Int. Cl.[2] B41B *17/00*

U.S. Cl. 354—7 **28 Claims**



1. In a photocomposition machine for recording type characters on a photosensitive member in accordance with type characters, values, and commands entered from an operator input station, the improvement comprising:

random access memory means for storing type character information data, value data and command data,

data input peripheral means inlcuding keyboard means at the operator station for providing data representative of input commands, values and type characters selected by the operator, said input commands comprising function commands including point size, font and line length selected by the operator,

control means for entering said command, value and type character data into said memory means,

means for generating a line completion signal,

display means at the operator station for visually displaying data stored in said memory in first, second and third predetermined viewing areas,

said first viewing area displaying symbols representative of selected commands and values associated therewith,

said second viewing area displaying finished data entered into said memory prior to the generation of the last preceding line completion signal,

said third viewing area displaying data entered into said memory subsequent to the generator of the last preceding line completion signal,

a phototypesetting unit, and

means for sequentially reading finished data from said meory to control the operation of said phototypesetting unit at the same time said finished data is being displayed in said second viewing area for reference by the operator.

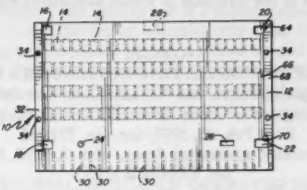
4,121,229
FONT ELEMENT FOR PHOTOCOMPOSING MACHINE

Ronald D. Edhlund, Mount Prospect, Ill., assignor to American Photo-Graphics Corporation, Elk Grove Village, Ill.

Filed Mar. 21, 1977, Ser. No. 779,468

Int. Cl.[2] G03B *17/06, 17/10*

U.S. Cl. 354—15 **8 Claims**



1. A font element for use in a photocomposing machine having a rotatable drum, the drum defining light-transmissive portions and having a pair of hooks for coupling to one edge of the font element and a pair of stationary buttons for coupling to the opposite edge of the font element, the font element comprising a flexible sheet on which character images are arranged, the font element defining apertures for receiving said hooks and apertures for receiving said buttons, and a reinforcing member secured to said one edge of the font element and adapted to underlie the hooks, the improvement comprising a second reinforcing member extending alongside the button-receiving apertures, said second reinforcing member having a main body portion and an angled portion adjacent the top of the font element and located to engage snugly the stationary button received by said one aperture, said angled portion extending from said main body portion and continously tapering toward a corner of the font element that is closest to the stationary button, the other portion of said second reinforcing member being located to engage the stationary button received by the other button-receiving aperture.

4,121,230
EXPOSURE CONTROL DEVICE FOR PHOTOGRAPHIC CAMERA

Hiroshi Ohmura, Yokohama, and Akira Kohashi, Chigasaki, both of Japan, assignors to Fuji Photo Film Co., Ltd., Minamiashigara, Japan

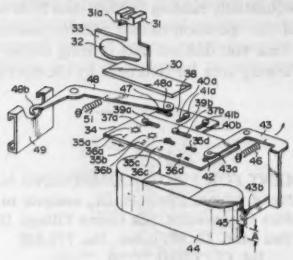
Filed Feb. 22, 1977, Ser. No. 770,650

Int. Cl.[2] G03B *7/00, 15/03, 17/26, 17/00*

U.S. Cl. 354—21 **10 Claims**

9. An exposure control device for a photographic camera comprising an exposure control means for changing an aperture size or a shutter speed, a mark indicating plate bearing thereon a plurality of exposure condition marks such as weather marks arranged in a line movable in the direction in which the exposure condition marks are lined, and a manually operable exposure control knob connected with said exposure control means, said exposure control knob having an index to be selectively aligned with one of said exposure condition marks and a film sensitivity sensing means which senses the

sensitivity of a film loaded in a film cartridge charged in the camera body, said film sensitivity sensing means being connected with said mark indicating plate to move the mark indicating plate in the direction in which said marks are lined.

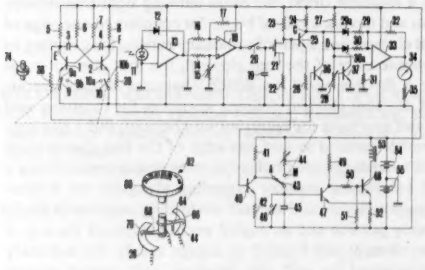


4,121,231

EXPOSURE FACTOR SETTING DEVICE FOR A CAMERA

Tatsuya Taguchi, Tokyo, and Nobuaki Date, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 23, 1977, Ser. No. 771,385
Claims priority, application Japan, Mar. 1, 1976, 51/21910
Int. Cl.² C03B *7/08*
U.S. Cl. 354—38 **16 Claims**



1. An exposure factors setting device for a camera having a manual exposure mode for controlling exposure time and an aperture size in accordance with a shutter speed and a diaphragm aperture which are manually adjusted, the exposure factor setting device comprising:

(a) light sensitive means for producing a first electrical signal corresponding to the brightness of a scene being photographed;

(b) first exposure factor setting means for producing a second electrical signal corresponding a first exposure factor manually set;

(c) a computer circuit response to said first and said second electrical signals for producing a third electrical signal corresponding to a second exposure factor capable of providing a correct exposure;

(d) second variable exposure factor setting means for producing a changeable fourth electrical signal corresponding to an exposure factor to be manually set and of the same kind as that of said second exposure factor;

(e) exposure factor indicating means; and

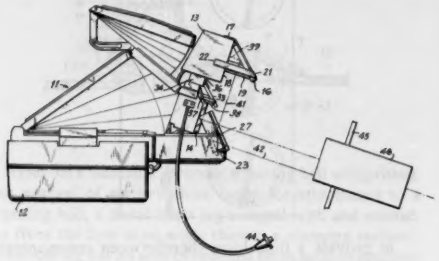
(f) first means for transferring the third electrical signal from said computer circuit and the fourth electrical signal from said second variable exposure factor setting means to said exposure factor indicating means during manual adjustment of the shutter speed and the diaphragm aperture in the manual exposure mode so said second variable exposure factor setting means may be varied until coincidence of the display content of the exposure factor indicating means is attained.

4,121,232

CIRCUMLENS CAMERA ILLUMINATION SYSTEM

Kenneth Malcolm Jones, P.O. Box 45, West Tisbury, Mass. 02575

Filed Nov. 5, 1976, Ser. No. 739,153
Int. Cl.² G03B *15/02*
U.S. Cl. 354—126 **19 Claims**



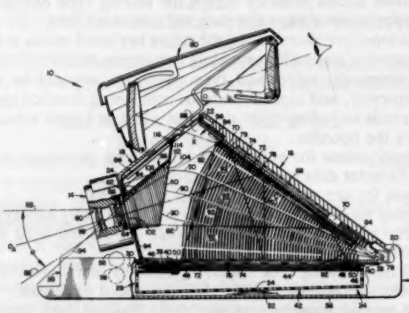
1. Apparatus for directing light from a flash source associated with a camera proximate to and approximately parallel to a line from the lens of said camera to selected subject matter, said flash source including a light source and a mounting, comprising a first mirror, first holding means for attaching said first mirror to said mounting, spacer means for orienting said first mirror at a selected first angle in relation to said light source, and at least a second mirror positioned adjacent said lens, said first angle being such that light from said light source is directed to said at least second mirror, said at least second mirror being oriented for making a second angle with the light reflected from said first mirror such that a substantial portion of said reflected light is again reflected proximate to and approximately parallel to said line joining said camera lens and said subject matter, said at least second mirror being positioned for allowing ready access to said camera lens and attachment of a close-up lens.

4,121,233

COLLAPSIBLE FLARE BAFFLE FOR FOLDING CAMERA

William Hudspeth, Norwell, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 27, 1977, Ser. No. 809,987
Int. Cl.² G03B *17/04, 17/50, 15/00, 17/02*
U.S. Cl. 354—150 **18 Claims**



1. A folding photographic camera comprising:

a plurality of housing sections interconnected for relative

movement with respect to one another to define a housing for said camera having a folded position wherein said housing sections are spatially arranged in a compact manner suitable for transporting said camera and an extended operative position wherein said housing sections are spatially arranged in a predetermined manner to define a space between them for facilitating exposure of a photographic film;

means within a first one of said housing sections for defining an exposure area at a focal plane and for facilitating the positioning of a photographic film in alignment with said exposure area;

optical means, including an objective taking lens mounted within a second one of said housing sections, for defining an optical path between said exposure area and said objective taking lens so that a real image of a photographic scene may be formed by said optical means on said focal plane when said camera housing is in said extended operative position, said optical means and the peripheral edges of said exposure area cooperating to provide said camera with a field of view which defines the area in object space that said camera will image on said focal plane during a photographic exposure cycle;

selectively actuable exposure means for defining a predetermined exposure cycle during which cycle, light from a photographic scene is imaged on said focal plane by said optical means;

a thin-walled opaque envelope configured and arranged between at least said first and second housing sections for movement in correspondence therewith between a collapsed state corresponding to said folded position of said camera housing wherein said envelope assumes a compact shape to facilitate the folding of said camera housing and an extended state corresponding to said extended position of said camera housing wherein said envelope is extended to define a light-tight exposure chamber of predetermined dimensions and shape extending between at least said first and second housing sections; and

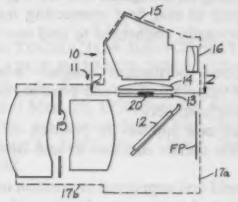
means positioned within said exposure chamber for intercepting light from outside of said field of view of said camera to prevent such intercepted light from impinging on said focal plane during said exposure cycle, said intercepting means comprising a collapsible open ended light baffle adapted to assume an extended predetermined configuration when said camera housing is in its said extended position and a compact collapsed configuration when said camera housing is in said folded position, said light baffle having inlet and outlet openings aligned along said optical path with its said outlet opening positioned internally of and spaced from the interior surfaces of said thin-walled opaque envelope when said light baffle is in its said extended position to permit light from within said field of view of said camera to pass through said light baffle and proceed toward said focal plane and portions intermediate said inlet and outlet openings arranged along said optical path to intercept light originating from outside of said field of view of said camera thus preventing such intercepted light from adversely affecting the quality of the image of the photographic scene formed on said focal plane during said exposure cycle.

4,121,234
FOCUSING AND PROJECTION SCREEN

Richard M. Altman, Woodland Hills, and Thomas D. McLaughlin, Thousand Oaks, both of Calif., assignors to Vivitar Corporation, Santa Monica, Calif.

Continuation of Ser. No. 606,350, Aug. 21, 1975, abandoned.
This application Apr. 5, 1977, Ser. No. 784,711
Int. Cl.[2] G03B *13/02, 19/12;* G02B *5/14*
U.S. Cl. 354—201 **15 Claims**

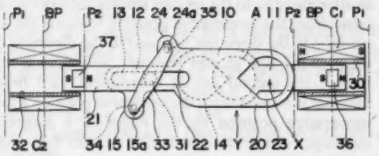
7. In a camera of the type arranged to mount interchangeable lens where the lens is focusable to create an image of an object in a depth of focus, means defining a focal plane, and a viewing system including a focusing screen subtending a plane that is the same distance from the exit pupil of a lens as the focal plane and is a continuation of the optical axis of the lens; said focusing screen comprising a multiplicity of light transmitting elements of finite length essentially uniformly arranged and closely spaced together, each element surrounded by a light absorbing and non-light transmissive material, said elements being of a length which resides within the focal range of a lens mounted to the camera and of a predetermined cross-sectional shape and dimension whereby only light of a predetermined angle of incidence or less is passed by said elements so that when the lens is focused such that its focus range includes the elements of said screen an image from said lens comes into sharp focus and bright illumination on said screen.



4,121,235
ELECTROMAGNETICALLY OPERATED SHUTTER MECHANISM

Susumu Fujita, Kobe; Seijiro Kushibe, Nishinomiya, and Hiroshi Shimizu, Matsubara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sep. 22, 1976, Ser. No. 725,201
Claims priority, application Japan, Sep. 29, 1975, 50-118093; Sep. 29, 1975, 50-118094; Sep. 23, 1975, 50-115249
Int. Cl.[2] G03B *9/08*
U.S. Cl. 354—234 **6 Claims**



1. A shutter mechanism for selectively closing and opening an exposure aperture through which, during opening of the aperture, the incoming light is allowed to pass therethrough, which comprises, in combination:

first and second shutter members supported in position for movement in opposite directions between their respective inoperative positions, in which the exposure aperture is closed, and their respective operative positions, in which the exposure aperture is opened;

said first shutter member including a first blade member having a first aperture formed wherein;

a substantially elongated first carrier member having one end thereof rigidly connected to said first blade member;

a first elongated guiding means extending in a direction parallel to the direction of movement of any one of said shutter members, said a first connecting member;

said second shutter member including a second blade member having a second aperture formed therein;

a substantially elongated second carrier member having one end thereof rigidly connected to said second blade member;

a substantially elongated bar member having one end thereof rigidly connected to said second blade member on an opposite side to the side where said second carrier member is connected;

a second elongated guiding means extending in a direction

parallel to the direction of movement of any one of said shutter members, and a second connecting member;

means connecting either one of said first and second shutter members to the other of said first and second shutter members for transmitting a movement of said first shutter member to said second shutter member, said transmitting means including an elongated link having one end pivotally connected to said first connecting member and the other end pivotally connected to said second connecting member;

first and second permanent magnet members rigidly mounted on respective free end portions of said first and second carrier members;

a first solenoid coil support in position to surround said elongated first carrier member in said first shutter member;

a second solenoid coil supported in position to surround said second elongated carrier member in said second shutter member; and

push-pull circuit means including first and second circuit components operable in opposed phase relationship to each other and electrically connected to said first and second solenoid coils, said first circuit component during its operation feeding an electric current from a D.C. power source so as to flow through at least one of said first and second solenoid coils in one direction while said second circuit component during its operation feeding the electric current so as to flow through at least one of said first and second solenoid coils in the opposite direction;

said first and second permanent magnet members being so positioned that, during the operation of the first circuit component, said first shutter member is moved from the inoperative position towards the operative position by the effect of a magnetic force developed between at least one of said first and second permanent magnets and at least one of said first and second solenoid coils then energized by the current flowing therethrough in said one direction while said link is rotated about a substantially intermediate portion thereof to transmit the movement of the first shutter member to the second shutter member to move the latter from the inoperative position towards the operative position in the direction opposed to the direction of movement of the first shutter member, and, during the operation of the second circuit component, said first shutter member is moved from the operative position towards the inoperative position by the effect of a magnetic force developed between at least one of said first and second permanent magnets and at least one of said first and second solenoid coils then energized by the current flowing therethrough in said opposite direction while said link is rotated about the substantially intermediate portion thereof to transmit the movement of the first shutter member to the second shutter member to move the latter from the operative position towards the inoperative position in the direction opposed to the direction of movement of the first shutter member.

4,121,236

APERTURE CARD CAMERA WITH DEVICE FOR SPRAYING THE EXPOSED FILM

Ulrich Welp, and Gero Sellien, both of Bad Nauheim, Fed. Rep. of Germany, assignors to Microbox Dr. Welp GmbH & Co., Bad Nauheim, Fed. Rep. of Germany

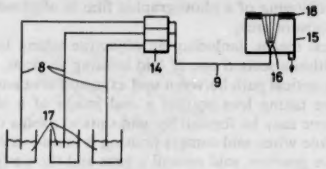
Filed Jun. 28, 1976, Ser. No. 700,388

Claims priority, application Austria, Jul. 4, 1975, 5190/75; Apr. 15, 1976, 2816/76

Int. Cl.[2] G03D *3/06*

U.S. Cl. 354—323 **9 Claims**

1. An apparatus for spraying an exposed film with processing liquid under pressure, said processing liquid including developer, fixer and water or fixer-developer and water, comprising container means for said processing liquid, processing means including a developing chamber and spraying nozzle means in said developing chamber, pump means including constant volume pump chamber means, suction pipe means operatively interconnecting said container means to said constant volume pump chamber means, pressure pipe means operatively connecting said nozzle means to said constant volume pump chamber means for conveying processing liquid under pressure from said container means to said nozzle means, said pump means further comprising first cover plate means, and second cover plate means as well as intermediate pump disc means operatively held in position between said first and second cover plate means to form said constant volume pump chamber means, first membrane means operatively clamped in position between said first cover plate means and said intermediate pump disc means, second membrane means operatively clamped between the intermediate pump disc means and said second cover plate means, pump operating conduit means, and controllable valve means operatively connecting said pump operating conduit means to said pump means for operating the pump means.



4,121,237

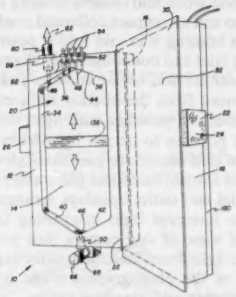
METHOD AND APPARATUS FOR PROCESSING PHOTOGRAPHIC FILM

Theodore F. Schwartz, Scottsdale, Ariz., assignor to The Scott & Fetzer Company, Fort Wayne, Ind.

Filed Jan. 21, 1977, Ser. No. 761,434

Int. Cl.[2] G03D *3/04*

U.S. Cl. 354—323 **13 Claims**



1. A photographic film processor comprising: a processing chamber including a peripheral wall, a resilient membrane forming another wall of said chamber, means for removably supporting a photographic exposure against said peripheral wall with the emulsion surface thereof disposed in parallel and closely spaced apart relationship to said membrane and closing said chamber, means for introducing and removing photographic processing chemistry components into and from said chamber individually and in sequence, and means for repetitively deforming said membrane to thereby agitate said chemistry components when in said chamber and develop said photographic exposure.

4,121,238
METAL OXIDE/INDIUM PHOSPHIDE DEVICES

Klaus Jurgen Bachmann, Piscataway; Paul Herman Schmidt, Chatham; Edward Guerrant Spencer, Murray Hill, and Karnamadakala Sreenivasacharlu Sree Harsha, North Plainfield, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

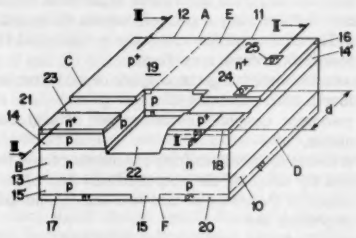
Filed Feb. 16, 1977, Ser. No. 769,107
Int. Cl.[2] H01L *27/14*
U.S. Cl. 357—16 **10 Claims**

1. A device comprising a p-type direct gap semiconductor material in intimate contact with a conducting transparent material characterized in that said conducting transparent material is chosen from the group consisting of indium oxide, and indium tin oxide, and said p-type direct gap semiconductor material is p-type InP whereby a rectifying junction is formed.

4,121,239
CONTROLLABLE SEMICONDUCTOR COMPONENT FOR TWO CURRENT DIRECTIONS

Günter Berndes, Heppenheim, and Eckhard Meyer, Lampertheim, both of Germany, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Jul. 12, 1977, Ser. No. 814,919
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1976, 2636234
Int. Cl.[2] H01L *29/747*
U.S. Cl. 357—39 **5 Claims**



1. A controllable semiconductor device for two current directions comprising:

a semiconductor wafer having a middle zone of a first conductivity type extending throughout the wafer plane, an upper zone of a second conductivity type adjoining the middle zone from above, a lower zone of the second conductivity type adjoining the middle zone from below, a first main electrode zone of the first conductivity type adjoining a first partial zone of the upper zone, a second main electrode zone of the first conductivity type adjoining a first partial zone of the lower zone and laterally separated from a second partial zone of the lower zone, a first control-electrode zone of the second conductivity type on the upper side of the upper zone at a lateral distance from the first main-electrode zone and separated therefrom by a channel, a second control-electrode zone of the first conductivity type on the upper side of the upper zone at a lateral and diagonal distance from the first main-electrode zone and laterally separated by the channel from a second partial zone of the upper zone, and a notch between the control-electrode zones which extends laterally partway between the first partial zone with the first main-electrode zone, on the one hand, and the second partial zone of the upper zone, on the other hand, and in its depth going from the upper towards the lower side of the semiconductor wafer partway into the middle zone;

a first main electrode contacting the first main-electrode zone and the second partial zone of the upper zone;

a second main electrode contacting the second main-electrode zone and the second partial zone of the lower zone;

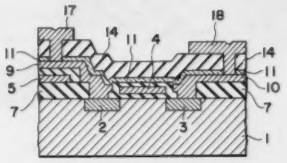
a control-electrode arrangement for separate contacting of the two control electrode zones; and

a case enclosing the wafer, wherein the two control-electrode leads are brought out electrically separated through the case from their separate control electrodes on the semiconductor wafer.

4,121,240
SEMICONDUCTOR DEVICE HAVING A DISCHARGE-FORMED INSULATING FILM

Hisao Katto, Hinode, Japan, assignor to Hitachi, Ltd., Japan

Filed Mar. 26, 1976, Ser. No. 670,831
Claims priority, application Japan, Mar. 26, 1975, 50-35568
Int. Cl.[2] H01L *29/34, 29/04, 29/46*
U.S. Cl. 357—52 **4 Claims**



1. A semiconductor device comprising

a semiconductor body including a semiconductor circuit element therein;

an insulating layer selectively disposed on the surface of said body and having at least one opening therethrough so as to expose at least one surface portion of said body;

a conductive layer selectively disposed on the surface of said insulating layer so as to expose at least one surface portion of said insulating layer, said conductive layer extending through said at least one opening through said insulating layer and contacting said at least one exposed surface portion of said body;

a protection layer disposed on both said conductive layer and said insulating layer, said protection layer including a semiconductor film overlying each portion of said conductive layer and said insulating layer on which said protection layer is disposed; and

a discharge-formed insulating film disposed on said semiconductor film,

wherein each of said protection layer and said insulating film has at least one aperture therethrough exposing at least one surface portion of said conductive layer, and further including a conductive contact layer disposed on said insulating film and extending through an aperture in each of said protection layer and said insulating film to contact said conductive layer.

4,121,241
MULTILAYER INTERCONNECTED STRUCTURE FOR SEMICONDUCTOR INTEGRATED CIRCUIT

Jerry W. Drake, Brookdale, and Peter J. Portesi, Mt. View, both of Calif., assignors to Raytheon Company, Lexington, Mass.

Filed Jan. 3, 1977, Ser. No. 756,509
Int. Cl.[2] H01L *23/48, 29/46, 29/54*
U.S. Cl. 357—71 **1 Claim**

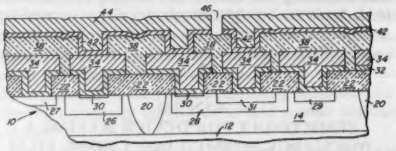
1. A semiconductor integrated circuit comprising:

(a) a first aluminum lead metal interconnecting system formed over a surface of a semiconductor body of such circuit;

(b) an insulating layer on the first lead metal interconnecting layer, such insulating layer having apertures formed in selected regions thereof;

(c) a titanium-tungsten mixture refractory metal layer deposited on the insulating layer and through the apertures onto

selected regions of the first lead metal interconnecting system; and



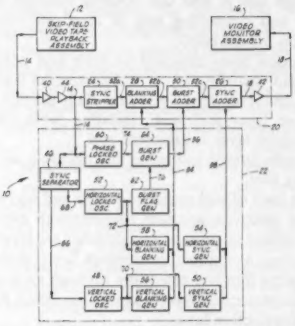
(d) a second aluminum lead metal deposited directly on the refractory metal layer.

4,121,242

VIDEO PROCESSOR PROVIDING SYNC STRIPPING AND REINSERTION

Mike A. Janko, 2616 N. Ann Arbor, Apt. 117, Oklahoma City, Okla. 73127

Filed Apr. 20, 1976, Ser. No. 678,556
Int. Cl.² H04N 5/76, 9/46, 5/04, 5/78
U.S. Cl. 358—4 **5 Claims**



1. A video processor for processing a video input signal provided by a skip-field video tape playback assembly and providing a video output signal having interlaced vertical sync signals, the processor comprising:

a video processing circuit connected to the skip-field video tape playback assembly, the video processing circuit receiving the video input signal and interlaced vertical sync pulses, and replacing the vertical sync pulses of the received video input signal with the received interlaced vertical sync pulses to provide the video output signal having interlaced vertical sync pulses; and

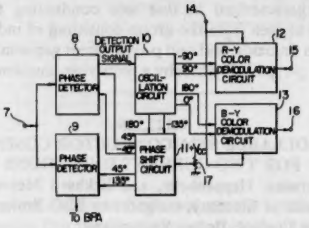
a sync generator connected to the skip-field video tape playback assembly and to the video processing circuit, the sync generator receiving the video input signal, detecting the vertical sync pulses of the received video input signal and providing the interlaced vertical sync pulses in response to detecting the vertical sync pulses of the received video input signal.

4,121,243

COLOR SUBCARRIER GENERATOR

Namio Yamaguchi, Ibaragi, and Yasuyuki Sato, Takatsuki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Mar. 28, 1977, Ser. No. 782,245
Claims priority, application Japan, Apr. 16, 1976, 51-43846; Aug. 9, 1976, 51-95283; Sep. 10, 1976, 51-109047; Sep. 13, 1976, 51-110237
Int. Cl.² H04N 9/46, 9/50
U.S. Cl. 358—19 **10 Claims**



1. A color signal processing circuit for a color television receiver comprising:

a color demodulation circuit;

an oscillator circuit comprising:

a first, second, third and fourth differential amplifiers,

means for coupling a pair of outputs from said second differential amplifier respectively with said third and fourth differential amplifiers,

means for combining the outputs of said first, third and fourth differential amplifier,

a resonator coupled to the output of said combining means,

first means for phase shifting the output of said resonator,

means for coupling the output of said first phase shifting means to the inputs of said first and second differential amplifiers, and

means for taking from the outputs of said first and second differential amplifiers four output signals at a frequency of a color subcarrier wave but differing from one another by 90° and supplying these four signals to said color demodulation circuit;

a phase shifter circuit comprising:

fifth and sixth differential amplifier circuits,

means for coupling two phase displaced signals from said oscillation circuit to the inputs of said fifth and sixth differential amplifier circuits,

means responsive to the outputs of said fifth and sixth differential amplifiers for producing a pair of output signals at a frequency of said color subcarrier wave but phase displaced, and

means for adjusting the bias voltages of said fifth and sixth differential amplifier circuits for changing the phase of said pair of output signals;

a phase detecting circuit comprising:

a seventh differential amplifier,

a switching device connected in series with said seventh differential amplifier,

means for supplying a color burst signal to the input of said switching device,

means coupling said pair of output signals from said phase shifter circuit to respective inputs of said seventh differential amplifier,

means for filtering the outputs of said seventh differential amplifier, and

means for coupling the outputs of said seventh differential amplifier corresponding to the phase difference between said color burst signal and said color subcarrier wave signal to bias adjusting inputs of said third and fourth

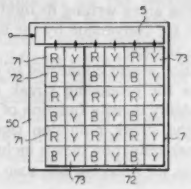
differential amplifiers to control the phase of said oscillation circuit.

4,121,244

SOLID STATE COLOR IMAGING APPARATUS

Ryuhei Nakabe; Yoshio Ohta, both of Hirakata, and Toshiro Matsuura, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Oct. 27, 1976, Ser. No. 736,186
Claims priority, application Japan, Oct. 24, 1975, 50-128752
Int. Cl.[2] H04N 9/07
U.S. Cl. 358—44 **26 Claims**



1. A solid state color imagining apparatus for producing a color signal representing a color image of an object, said apparatus comprising:

photosensitive means including a plurality of pairs of lines of photosensitive elements with the lines in each pair being different from each other and the pairs of lines being positioned one above the other with the different kinds of lines in alternating sequence in the direction of a vertical scan of said photosensitive means, each of said photosensitive element lines having light sensitivity elements of two kinds in alternating sequence in the direction of a horizontal scan of said photosensitive means;

clock signal generating means for generating a clock signal;

signal reading means coupled to said photosensitive means and said clock signal generating means for operating said photosensitive means for reading out in synchronism with said clock signal charge signals from said photosensitive means for producing a first signal and a second signal alternately in successive horizontal scans; said first signal including portions representative of a first light component and of a second light component in alternating sequence and said second signal including portions representative of a third light component and of a fourth light component in alternating sequence; and

circuit means coupled to said photosensitive means for receiving the first and second signals and deriving a modulated component therefrom which represents the color difference of the image and modulated with the repetition frequency of said photosensitive elements; and

demodulating circuit means coupled to said filter circuit means and said clock signal generating means for receiving the modulated component and demodulating the color difference signals in synchronism with said clock signal.

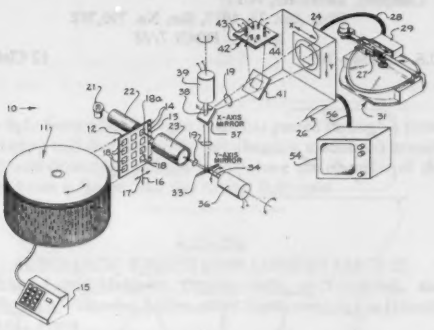
4,121,245

IMAGE REGISTRATION SYSTEM FOR VIDEO CAMERA

Earl R. Hibbard, Berkeley, Calif., assignor to Teknekron, Inc., Berkeley, Calif.

Filed Apr. 11, 1977, Ser. No. 786,448
Int. Cl.[2] H04N 7/18; G01B 11/26; G06K 9/04
U.S. Cl. 358—102 **6 Claims**

1. In a system for accurately projecting an image of a prerecorded image upon light responsive means of a T.V. camera comprising a light source projecting light along a predetermined path, means for supporting a prerecorded image of a document in a plane disposed across said path, said light path transmitting an image of said prerecorded image therealong to the camera, movable mirror means in said light path for deflecting the light path and image, positioning means for moving said mirror means to displace the light path to move the image with respect to said light responsive means, means including at most one partially silvered mirror in said light path for detecting inaccurate registration of said image relative to said light responsive means along each of two mutually perpendicular axes and serving to operate said positioning means to move said mirror means to cause the image to be moved into predetermined registration with respect to said light responsive means, the last named means comprising first and second circuit means and an array of light responsive elements disposed in a configuration coextensive with the bounds of the image, those of said elements disposed on opposite sides of said configuration being paired to form portions of an associated one of said first or second circuit means to provide signals from said first or second circuit representing the degree and direction of misregistration between the image and said light responsive means with respect to an associated one of said pairs of elements.

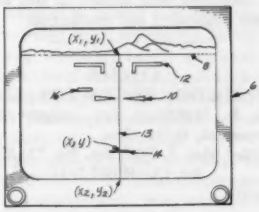


4,121,246

GROUND IMPACT POINT PREDICTION SYSTEM CONCEPT FOR AIRDROPS

Delmar McLean Fadden, Kent; Alvin Richard Habbestad, Seattle, and James Edwin Veitengruber, Bellevue, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 726,870, Sep. 27, 1976, abandoned. This application Aug. 8, 1977, Ser. No. 822,753
Int. Cl.[2] H04N 7/18
U.S. Cl. 358—103 **3 Claims**



1. A method for tracking and displaying an airdrop target point to the crew of an aircraft which comprises:

(a) displaying an image of the terrain ahead of an aircraft including the airdrop target point on an apparatus showing the aircraft flight path characteristics;

(b) generating a line representing the locus of instantaneous impact points of an airdrop load along the terrain and superimposing said line on said image;

(c) generating a line representing the instantaneous impact point of an airdrop load on the terrain and superimposing said line on said image; and,

(d) aligning the flight path of the aircraft with said line

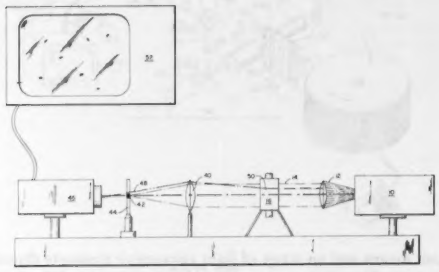
representing the locus of instantaneous impact points until said line representing the instantaneous impact point overlays said airdrop target at which point an airdrop load is released.

4,121,247

POPULATION AND PROFILE DISPLAY OF TRANSPARENT BODIES IN A TRANSPARENT MASS

James W. Henry, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 21, 1977, Ser. No. 790,792
Int. Cl.[2] H04N 7/18
U.S. Cl. 358—107 **12 Claims**



1. Method of displaying population and profile data of transparent bodies contained within a transparent mass wherein said bodies are not distinguishable from said mass by the unaided eye and said bodies and said mass have different indexes of refraction comprising

(a) moving a specimen of the mass containing said bodies into an optical viewing position wherein said specimen is intercepted by a columned beam of parallel light rays of a schlieren optical system whereby rays penetrating said mass continue in substantially the same columned state and rays penetrating said bodies are deviated from said columned beam of light to form an image of the profile of said bodies within said mass,

(b) detecting at least a portion of said deviated rays by a television camera, and converting the image into a video signal, and

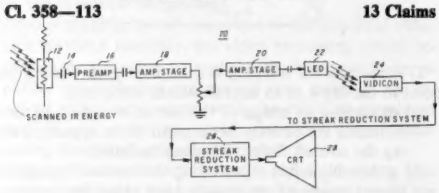
(c) using said video signal as the input to a kinescope display device having amplifier means, whereby the image of said bodies is amplified with respect to size and contrast to display said population and profile data.

4,121,248

STREAK REDUCTION SYSTEM FOR FLIR DISPLAY

Cecil R. Coale, Jr., McKinney, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 7, 1977, Ser. No. 774,839
Int. Cl.[2] H04N 5/33
U.S. Cl. 358—113 **13 Claims**



1. A forward looking infrared system comprising:

(a) a detector array having a plurality of detector elements for producing a plurality of electrical scan lines responsive to infrared energy emanating from a scene;

(b) an a.c. coupling means for each detector element of the array of detectors for coupling the electrical energy for each scan line to an amplifier stage;

(c) a light emitting array means having a plurality of light emitting elements, each light emitting element connected to a corresponding detector element amplifying stage for producing a visible image of the electrical representations of each detector element line scan for producing a visible display representative of the infrared energy emanating from the scene;

(d) a scanning means, in the path of said light emitting array, said light emitting array writing its light scan lines on the scanning means for conversion by the scanning means to electrical video signals;

(e) a streak reduction means connected to the output of said scanning means for producing streak reduction signals from the probability density function of a video scan line and applying the streak reduction signal to the video signal, said streak reduction means including:

(i) a delay means for delaying one scan line of video signals;

(ii) means for locating the mean voltage of a succeeding scan line of video signals;

(iii) means for locating the mode voltage of the probability density function for the succeeding scan line of video signals;

(iv) comparing means for comparing the mean voltage and the mode voltage for producing a streak correction signal for the video signals;

(v) means for applying the streak correction signal to the video signals of the display means; and

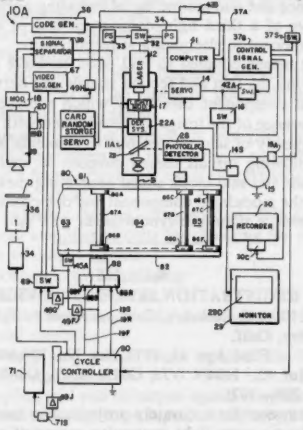
(f) a display for displaying the video signal.

4,121,249

CARD RECORDING AND REPRODUCTION APPARATUS AND METHOD

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 474,392, May 30, 1974, abandoned, which is a continuation-in-part of Ser. No. 277,401, Aug. 2, 1972, Pat. No. 3,818,500, and Ser. No. 277,402, Aug. 2, 1972, abandoned. This application Feb. 3, 1976, Ser. No. 654,939
Int. Cl.[2] H04N 5/86
U.S. Cl. 358—132 **6 Claims**



4. Document storage apparatus for generating visual picture images of information recorded as a plurality of separate optically scannable video recordings wherein each of said separate video recordings occupies a respective elongated narrow strip

portion of a record card and wherein said narrow strip portions of each card define record tracks which are parallel to each other, said apparatus comprising:

first means for generating a beam of reading radiation,

second means for prepositioning a record card with respect to said radiation beam generating means,

third means for effecting movement of said card in a manner to cause said beam to scan a selected video recording extending along a selected of said record tracks to cause radiation of said beam to be modulated in scanning the narrow strip portion of said card containing the selected video recording, and

fourth means for receiving the radiation of said beam after it has been modulated by the selected video recording scanned by said beam, said fourth means including light sensitive electrical signal generating means operable to generate a full-frame video picture signal on its output in accordance with the characteristics of the video recording of the track scanned,

fifth means for receiving the signal output of said fourth means, said fifth means including a video monitor having a viewing screen and electronic writing means responsive to said full-frame video signal generated on the output of said fourth means for generating a visually monitorable image on said screen which image is a pictorial representation of the recording on the track of said card scanned, and

means for retaining said image on said screen for an extended period of time to permit it to be viewed by a person and to be monitored.

4,121,250

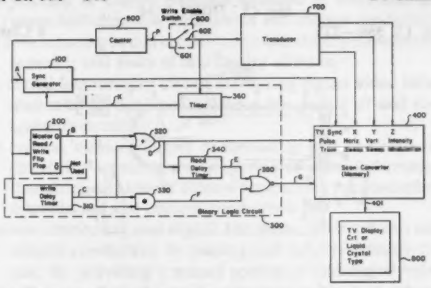
FLICKER FREE SCAN CONVERSION SYSTEM

Kenneth A. Huelsman, Carlsbad, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jul. 26, 1976, Ser. No. 708,677

Int. Cl.² H04N *7/18*

U.S. Cl. 358—140 **24 Claims**



19. A flicker-free visual display system having a transducer feeding a scan converter memory and utilizing two fields per raster frame readout, comprising the combination:

first means for writing odd and even number of segmentary portions of lines in alternation for each repetition period of output from said transducer; and

second means comprising a TV type viewer and said scan converter memory feeding said viewer for inhibiting the display of alternate lines of each of the raster fields.

4,121,251

METHOD OF DETECTING A SYNCHRONIZING LIGHT BEAM

Noboru Arai, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minamiashigara, Japan

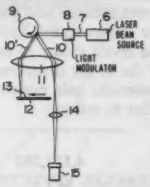
Filed Apr. 27, 1977, Ser. No. 791,404

Claims priority, application Japan, Apr. 28, 1976, 51-49085

Int. Cl.² H04N *5/84, 5/06, 5/08, 5/74*

U.S. Cl. 358—150 **5 Claims**

1. A method of detecting a synchronizing light beam in a light beam scanning system for recording or displaying information by use of a light beam modulated by a video signal wherein the scanning light beam is detected at a predetermined position while the light beam is scanning a line, said light beam being focused to form a light spot on the line wherein the improvement comprises the steps of enlarging the diameter of



the light beam after the light beam has passed through a plane including said line before the light beam is modulated in each line, and detecting the light beam where the diameter of the light beam is larger than that of said light spot.

4,121,252

AUTOMATIC BRIGHTNESS LIMITER CIRCUIT

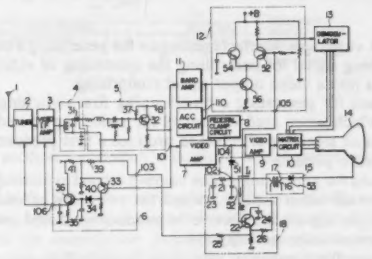
Yukimi Saiki; Masanori Oguino, both of Yokohama, and Shutoku Watanabe, Ashiya, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 7, 1976, Ser. No. 703,235

Claims priority, application Japan, Jul. 9, 1975, 50/83504; Apr. 26, 1976, 51/46568

Int. Cl.² H04N *5/14, 5/68*

U.S. Cl. 358—169 **6 Claims**



1. A television receiver comprising:

an amplifier adapted to receive a television signal including a composite video signal component having a first predetermined level which is a carrier zero level and a second predetermined level which is a synchronizing signal peak value, for amplifying said television signal;

a detector for detecting the amplified television signal to produce a composite video signal;

an automatic gain control circuit for comparing said second predetermined level in the detected composite video signal with a preset level while fixing said first predetermined level in the detected composite video signal at a first fixed level and controlling the gain of said amplifier in the direction to cause said second predetermined level to coincide with said preset level;

a CRT adapted to receive the detected composite video signal;

a power supply for supplying a beam current to the CRT; and

beam current limiting means connected to the CRT and the power supply for reducing the beam current when it exceeds a predetermined level to prevent the increase of the beam current;

said beam current limiting means including:

detection means for detecting the change in the beam current; and

control means for receiving an output signal from said detection means and causing said first predetermined level to approach toward said second predetermined level when the beam current exceeds said predetermined level so that the composite video signal having its first and second predetermined levels closer to each other is produced at the output of the of the detection means;

whereby the automatic gain control circuit causes the gain of said amplifier to reduce.

4,121,253

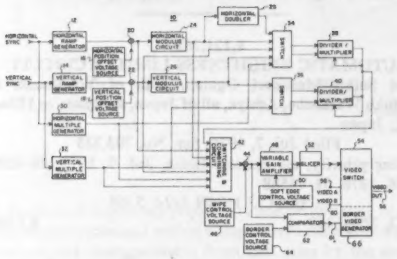
VIDEO SPECIAL EFFECTS GENERATOR

Reginald F. H. McCoy, Gainesville, Fla., assignor to Vital Industries, Inc., Gainesville, Fla.

Filed Aug. 20, 1976, Ser. No. 716,217

Int. Cl.[2] H04N 5/22

U.S. Cl. 358—181 **25 Claims**



1. A video special effects generator for generating a complex switching signal for controlling the combining of video input signals into a video output signal comprising:

means for generating a time varying first switching signal which when used to control the switching of said video input signals is effective to produce a first predetermined video pattern;

means for generating a time varying second switching signal which when used to control the switching of said video input signals is effective to produce a second predetermined video pattern; and

means for combining said time varying first and second switching signals in predetermined proportions to provide said complex switching signal to provide a more complex video pattern.

4,121,254

AUTOMATIC FINE TUNING CIRCUIT

Kouji Morita, Kodaira, and Katsuo Isono, Kawagoe, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 27, 1976, Ser. No. 754,167

Claims priority, application Japan, Dec. 26, 1975, 51-157207; Dec. 26, 1975, 51-157208

Int. Cl.[2] H04N 5/50; H04B 1/26

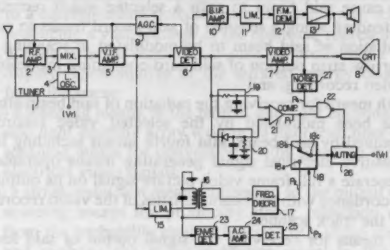
U.S. Cl. 358—195 **5 Claims**

1. An automatic fine tuning circuit for controlling the frequency to which the tuner of a television receiver is tuned, said receiver comprising a video IF amplifier, a video detector to detect the envelope of the video IF signal, and an audio circuit, said automatic fine tuning circuit comprising:

first means for forming a first detecting signal, said first means comprising a source of reference voltage and a comparator connected to said video detector to compare the average voltage level of the output signal of said video detector with said reference voltage and to provide said first detecting signal in dependence on such comparison;

second means for forming a second detecting signal comprising a frequency discriminator and means connecting said video IF amplifier to said frequency discriminator so that the output of the latter constitutes said second detecting signal; and

third means for selectively controlling the tuning of said tuner in response to one of said first and second detecting signals, said third means including means responsive to the output of said video IF amplifier to select said second



detecting signal for control of said tuner when the latter is tuned to a frequency within a predetermined frequency band that includes a television channel signal and to select said first detecting signal for control of the tuner when the latter is tuned to a frequency outside of said frequency band.

4,121,255

TELEVISION CAMERA APPARATUS

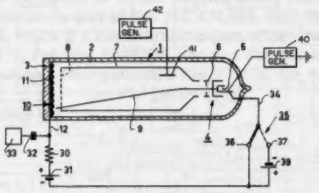
Paulus Philippus Maria Schampers; Marino Giuseppe Carasso, and Frits Theodoor Klostermann, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 3, 1976, Ser. No. 663,269

Claims priority, application Netherlands, Mar. 24, 1975, 7503462

Int. Cl.[2] H04N 5/34

U.S. Cl. 358—223 **8 Claims**



1. In a television camera apparatus including a television camera tube comprising an evacuated envelope having an optically transmissive window at one end, an electrically continuous transparent signal electrode supported by said window, a target of photoconductive material having regularly spaced and discrete portions in contact with said signal electrode, and an electron gun for scanning the surface of said target with an electron beam, the improvement wherein regularly spaced and discrete portions of the photoconductive material and portions of the signal electrode substantially intermediate said spaced portions are accessible to the electron beam, the apparatus further including means for scanning the electron beam across the target and means for applying first and second voltages between the signal electrode and the electron source respectively during scanning and during flyback, the first voltage applied during scanning being such that a portion of the electron beam current dependent on the local degree of illumination of the photoconductive material flows into the signal electrode without the potential of a free surface of the photoconductive material being stabilized, and the second voltage being applied during flyback being such that the potential of said surface is stabilised by the electron beam.

4,121,256

COLUMN ELECTRODE DRIVE FOR GAS DISCHARGE DISPLAY DEVICE

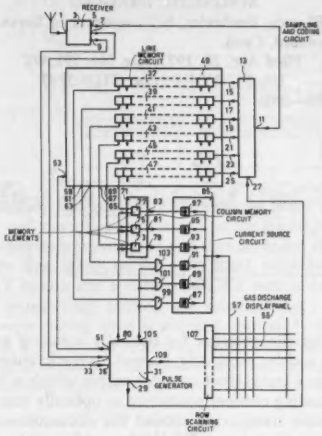
Jean Hubertus Josef Lorteije, and Geert Warrink, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 10, 1977, Ser. No. 776,253

Claims priority, application Netherlands, Mar. 24, 1976, 7603056

Int. Cl.[2] H04N *3/12*; H05B *41/00*

U.S. Cl. 358—240 3 Claims



1. A display device comprising

a plurality of display elements arranged in rows and columns, including row conductors and column conductors;

a row scanning circuit connected to said display elements for scanning said rows of said display element;

a digital line memory circuit for storing digital video information to be displayed during a line period of said row scanning circuit;

a column memory circuit connected to said line memory circuit for acquiring a first portion of video information therefrom, and to said column conductors, for controlling activation of said column conductors; and

means connecting said digital line memory circuit and said column conductors, by passing said column memory circuit, for providing a second portion of said digital video information stored in said memory circuit to said column conductors during the line blanking period, the display of said first and second portions of said video information taking place during the same line period.

4,121,257

CATHODE-RAY TUBE WITH DOUBLE TENSION BAND

Varahur Ramaswamy Krishnamurthy, Penetang, Canada, assignor to RCA Corporation, New York, N.Y.

Filed Feb. 28, 1977, Ser. No. 772,998

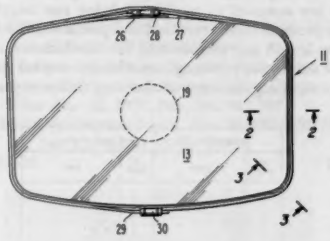
Int. Cl.[2] H01J *29/87*

U.S. Cl. 358—246 10 Claims

1. A cathode-ray tube comprising an evacuated glass bulb comprising a faceplate panel joined to a funnel, said tube having an improved implosion-protection system consisting essentially of

(a) a first smooth-plastic-coated steel band laid directly on and encircling said panel and tensed to provide hoop compression in said bulb, the ends of said first tension band being secured together,

(b) and a second smooth-plastic-coated steel band laid directly on and encircling said first steel band and tensed to



provide hoop compression in said bulb, the ends of said second tension band being secured together.

4,121,258

METHOD FOR CODING FACSIMILE SIGNAL

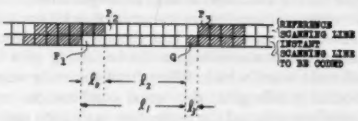
Yukio Nakagome, Yokohama; Hiroichi Teramura, Tokyo; Yasuhiro Yamazaki, Hiratsuka, and Yasushi Wakahara, Tokyo, all of, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Nov. 8, 1976, Ser. No. 740,073

Claims priority, application Japan, Nov. 7, 1975, 50-133745

Int. Cl.[2] H04N *1/40*

U.S. Cl. 358—260 4 Claims



1. A method for coding a facsimile signal comprising the steps of:

first coding, for each scanning line, addresses of information change picture elements each having information different from the immediately preceding picture element on the same scanning line of a facsimile signal to develop a first coded output; and

receiving said first coded output and secondly coding the relative distance of each of said information change picture elements to a final reference change point which is selected from information change picture elements on at least one scanning line including the instant scanning line having an instant information change picture element to be coded to develop a second coded output.

4,121,259

METHOD FOR DIGITAL RUN-LENGTH CODING WITH REDUNDANCE REDUCTION FOR TRANSMISSION OF BINARILY CODED PICTURE INFORMATIONS

Dieter Preuss, Berenbostel, and Peter Segin, Hanover, both of Germany, assignors to Dr.-Ing. Rudolf Hell GmbH, Germany

Filed Nov. 23, 1976, Ser. No. 744,341

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1975, 2552751

Int. Cl.[2] H03K *13/24*; H04L *3/00*; H04N *1/40, 7/12*

U.S. Cl. 358—261 17 Claims

1. The method for digital run-length coding with redundancy reduction for the transmission of binary coded picture information which is derived by electro-optically scanning a picture original line by line converting the derived picture signals in run-lengths of black and white picture information, assigning to said run-lengths binary code words of different lengths which are transmitted over a transmission channel and

are decoded at the receiver, obtaining the transmitted code words by searching in a code word table in which all occurring code words are stored and where short code words are assigned to frequently occurring run-lengths, and longer code words are assigned to rarely occurring run-lengths, assigned from a predetermined run-length a prefix word to the respective run-length and transmitting the combination of the prefix and the respective run-length as a binary number, the improvement comprising the steps of choosing different predetermined

white lengths		black lengths	
run length	code	run length	code
1	1110	1	0
2	10	2	10
3	01	3	1100
4	110	4	1101
5	00001	5	1110
6	00010	6	11110
7	00011	7	11111100
8	00100	8	11111101
9	0010 10	9	1111110
10	0010 11	10	11111110
11	0011000		
12	0011001	>10	11111111 xxxxxxxxxx
13	0011010		binary number >10
14	0011 0110		
15	0011 0111		
16	0011 1000		
17	0011 1001		
18	0011 1010		
19	0011 1011 0		
20	0011 1011 1		
21	0011 1100		
22	0011 1101		
23	0011 1110		
24	0011 1111		
25	0011 1100		
26	0011 1101		
27	0011 1110		
28	0011 1111 0		
29	0011 1111 10		
30	0011 1111 11		
>30	1111 xxxxxxxxxx		
	binary number > 30		
white line	only line beginning word		
beginning of a line	00000 0000000000 1 (x)		

x can be 1 or 0

run-lengths for the black and white run-length from which the black and white run-lengths are transmitted as bit combination of two different prefix words and the respective black and white run-lengths, transmitting at the beginning of a line an individual code word which differs from the code words for the individual run-lengths, the word combination resulting from the prefix words and the respective run-length and which does not appear in the transmission data flow as a bit combination of several words or partial words, respectively.

4,121,260

TRANSCEIVER SYSTEM FOR VISIBLE IMAGES

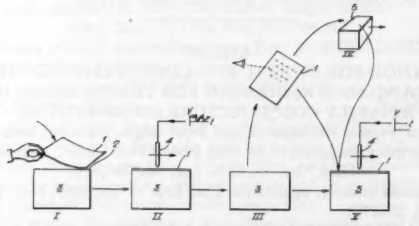
Malcolm Stuart Dye, Biggleswade; Michael James Redman, Datchworth, and David W. Satchell, Welwyn Garden City, all of England, assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 4, 1977, Ser. No. 784,490

Claims priority, application United Kingdom, Oct. 14, 1976, 42635/76

Int. Cl.[2] H04N *1/02, 1/12, 1/24*

U.S. Cl. 358—295 **4 Claims**



1. A transceiver system for graphical information comprising a recording sheet having at least a layer of an electrochromic material, a conductive support platen for said recording sheet, and a stylus array comprising a plurality of styli for scanning the sheet supported on the platen, the stylus array and the platen being mounted for relative movement, the system including receive means for selectively applying electrical potentials to individual ones of said styli during scanning so as to cause selective coloration of the electrochromic material in accordance with received electrical signals representing incoming graphical information, and transmit means, responsive to electrical potentials corresponding to outgoing graphical information and detected by individual ones of said styli, for transmitting electrical signals representing said outgoing graphical information.

4,121,261

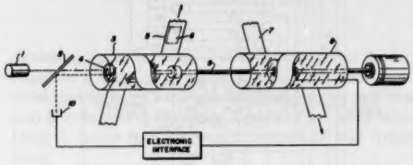
SYNCHRONOUS HELICAL SCAN-HELICAL RECORD MAGNETIC IMAGING

Daniel F. Blossey, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 28, 1977, Ser. No. 791,892

Int. Cl.[2] H04N *1/24; G11B 5/43*

U.S. Cl. 358—301 **4 Claims**



1. A magnetic recorder for optically scanning an original document and for producing a latent magnetic image thereof, comprising: a transparent cylinder within which is located an optical scanning element positioned to optically scan an original document transported around the circumference of said transparent cylinder in helical-wrap configuration; a second cylinder in substantial longitudinal alignment with said transparent cylinder and within which is located a rotational member having at least one magnetic record head mounted thereon, said rotational member positioned within said second cylinder to magnetically record a magnetizable member transported around the circumference of said second cylinder in helical-wrap configuration; means for rotating said optical scanning element and said rotational member without substantial translation thereof; and, means for converting signals from said optical scanning element into reversals of electric current flow through said at least one record head including deskew circuit means and a data buffer for said magnetic record head, said deskew circuit means electrically connected to provide a signal to initiate the unloading of each data buffer at a time effective to substantially align pixels recorded in adjacent tracks.

4,121,262

MAGNETIC RECORDING/REPRODUCING DEVICE

Yoji Ushio, Tokyo; Chiaki Taketomi, Yono, and Tutomu Asaga, Tokyo, all of Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Apr. 28, 1977, Ser. No. 791,694

Claims priority, application Japan, Apr. 30, 1976, 51-49659

Int. Cl.[2] G11B *27/02, 15/12*

U.S. Cl. 360—13 **1 Claim**

1. A magnetic recording/reproducing device in the form of a double cassette deck comprising:

a first tape transporting portion for a first cassette tape,

a second tape transporting portion for a second cassette tape,

a recording/reproducing head in relation to said first tape transporting portion,

a reproducing head in relation to said second tape transporting portion,

a single recording system,

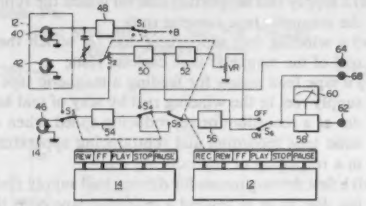
a single reproducing system,

a first switching means for electrically coupling said recording/reproducing head from said reproducing system to

said recording system in response to the operation of an REC button on said first tape transporting portion, and

a second switching means for electrically coupling said reproducing head from said recording system to said reproducing system in response to the operation of a PLAY button on said second tape transporting portion

whereby, when both of said PLAY button and said REC button are simultaneously operated, said reproducing head is coupled with said reproducing system and, at the same time, said recording/reproducing head is coupled with said recording system so that the signal in said second cassette is reproduced and then recorded on said first casette tape, while, on the other hand, when both of said PLAY button and a different PLAY button on said first tape transporting portion are simultaneously operated, said reproducing head is coupled with said reproducing system prior to said recording/reproducing head so that the signal in said second cassette tape and the signal in the first cassette tape are successively reproduced in order.

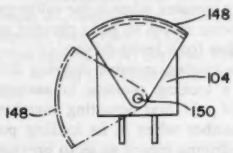


4,121,263

METHOD AND APPARATUS FOR CONTROL SIGNAL SEPARATION TO REGAIN SYNCHRONIZATION BETWEEN A VISUAL IMAGE PROJECTOR AND AN AUDIO PROGRAM

Arthur B. Price, Byron, N.Y., assignor to The Singer Company, New York, N.Y.

Filed Jul. 27, 1977, Ser. No. 819,430
Int. Cl.[2] G11B *5/43, 5/22*
U.S. Cl. 360—27 **46 Claims**



1. Apparatus for a magnetic tape playback machine to attenuate recorded audio signals relative to super-imposed control signals during fast forward or fast rewind of said magnetic tape where the audio signals have been recorded in a first frequency range and the control signals have been recorded in a second frequency range and where the second frequency range is less than the first frequency range comprising:

a playback head having a sensing surface for sensing signals recorded on said magnetic tape;

magnetic tape transport means for supporting and transporting said magnetic tape past said sensing surface of said playback head in said fast forward or said fast rewind direction;

a spacer having a thickness dimension mounted on said sensing surface of said playback head to space the magnetic tape from said sensing surface of said playback head during said fast forward or fast rewind motion;

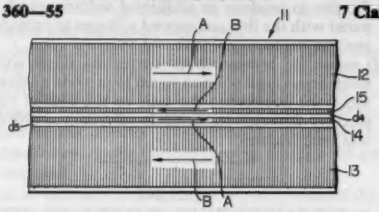
whereby the frequency response versus the playback head to magnetic tape spacing characteristic attenuates said higher frequency audio signals relative to said lower frequency control signals.

4,121,264

METHOD FOR RECORDING INFORMATION SIGNAL AND CONTROL SIGNAL

Yoshio Kishi, Tokyo, and Masaru Nagami, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 26, 1977, Ser. No. 762,767
Claims priority, application Japan, Jan. 26, 1976, 51-7428[U]
Int. Cl.[2] G11B *15/02, 23/18*
U.S. Cl. 360—55 **7 Claims**



1. The method of recording a plurality of main signals and a corresponding plurality of secondary signals of a control nature related to said main signals, said main signals and said secondary signals being recorded in parallel tracks on a recording medium, said method comprising the steps of:

recording at least one first main track and a corresponding first secondary track spaced apart from each other, said first main track being wider than said corresponding secondary track; and

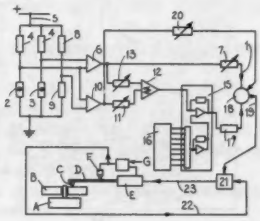
recording at least one second main track and a second secondary track also spaced apart from each other, said second main track being wider than said second secondary track, said first secondary track being recorded in the space between said second secondary track and said second main track and said second secondary track being recorded in the space between said first secondary track and said first main track, with all of said tracks being separated from each other by guardbands.

4,121,265

TEMPERATURE COMPENSATION FOR DATA STORAGE APPARATUS

Roman Derc, Bracknell, England, assignor to Data Recording Instrument Co., Ltd., Staines, England

Filed Jan. 26, 1977, Ser. No. 762,744
Claims priority, application United Kingdom, Feb. 6, 1976, 4686/76
Int. Cl.[2] G11B *5/56*
U.S. Cl. 360—78 **5 Claims**



1. In a disc drive system of the type having a movable head positioning mechanism which is servoed to position a head to a desired track of a disc pack located in an environment in which the disc file in the region of the head mechanism is likely

to have a temperature which is different from that of the discs, which comprises

(a) means for generating a first voltage proportional to the difference between the temperature of the disc file in the region of the head mechanism and the disc pack;

(b) means for separatly generating a second voltage proportional to the difference between the voltage related to the temperature of the disc file in the region of the head mechanism and a reference voltage;

(c) means for comparing a signal proportional to the first and second voltages with a further signal proportional to the address of the track to which the head is to be positioned thereby to produce an additional voltage which is compared with the first and second voltages to provide a head position correcting signal; and

(d) means for comparing the correcting signal with an instantaneous head position signal to provide a drive control signal for positioning the head to the desired track irrespective of overall temperature variations or differences in said temperatures.

4,121,266

POLYAMIDE-IMIDE PRECONDENSATES

Jenoe Kovacs, Bobenheim-Roxheim; Hans Jung, Ludwigshafen; Matthias Marx, Bad Durkheim, and Herbert Spoor, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed Jun. 7, 1976, Ser. No. 693,351

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1975, 2528251

Int. Cl.[2] C08G *69/26, 73/14*

U.S. Cl. 528—288 **2 Claims**

1. A process for the manufacture of polyamide-imide precondensate, which is solid at room temperature but is fusible and soluble in polar solvents, by reacting an aromatic tricarboxylic acid anhydride with a diprimary aromatic amine in the presence of an aliphatic diol, in which reaction first 1 mole of diamine is condensed with 2 moles of tricarboxylic acid anhydride in the diol as the solvent, at below 150° C., to give a diimide-dicarboxylic acid, the latter is then esterified

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4,121,267

HIGH SPEED FEEDING AND REWINDING MECHANISM IN A MAGNETIC TAPE RECORDING AND REPRODUCING APPARATUS

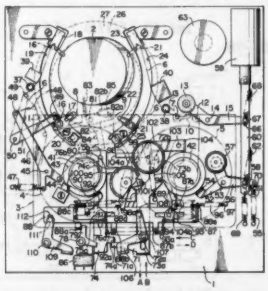
Yoshiaki Hayashi, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed Apr. 28, 1977, Ser. No. 791,685

Claims priority, application Japan, May 4, 1976, 51-51030

Int. Cl.[2] G11B *15/66*

U.S. Cl. 360—85 **7 Claims**



1. In a magnetic tape recording and reproducing apparatus comprising:

(i) a head cylinder accommodating therein a plurality of magnetic heads;

(ii) tape lead-out means for drawing out a magnetic tape from a tape cassette accommodating therein a supply reel and a winding reel, and for winding the magnetic tape drawn out around the peripheral wall of said head cylinder,

said tape lead-out means having tape lead-out pins which move, when a recording or reproducing button is actuated, from a non-operative position where the tape lead-out pins are within the tape cassette to an operative position where the tape lead-out pins are in the vicinity of said head cylinder;

(iii) a supply reel supporting disc on which the supply reel of the magnetic tape cassette rests;

(iv) a winding reel supporting disc on which the winding reel of the magnetic tape cassette rests;

(v) a tape feed means for feeding a magnetic tape from the supply reel to the winding reel by way of said head cylinder at a recording or reproducing speed when said magnetic tape recording and reproducing apparatus operates in a recording or reproducing mode;

(vi) a first driving means for driving said supply reel supporting disc so as to rewind a magnetic tape onto the supply reel, said first driving means operating at a low speed when the tape lead-out pins return from the operative position to the non-operative position upon an actuation of a stop button or upon a detection of one end of a magnetic tape in a recording or reproducing mode, and operating at a high speed when said magnetic tape recording and reproducing apparatus operates in a rewinding mode upon actuation of a rewind button;

(vii) a second driving means for driving said winding reel supporting disc so as to feed a magnetic tape from the supply reel to the winding reel at a higher speed than the recording or reproducing speed when a high speed feed button is actuated;

(viii) a switch means for switching the speed of said first driving means from the low speed to the high speed when the rewind button is actuated;

the improvement being a high speed feeding and rewinding mechanism comprising:

(i) a first actuating member moving from its rest position to its active position when the recording or reproducing button is actuated and returning to the rest position when the stop button is actuated or when one end of a magnetic tape is detected in a recording or reproducing mode, said first actuating member when in the active position holding said first driving means so as to prevent said supply reel supporting disc from being driven;

(ii) a second actuating member moving from its original position to a locking position in association with the movement of said first actuating member, said second actuating member when in its locking position holding said second driving means so as to prevent said winding reel supporting disc from being driven at said higher speed, said second actuating member when in its original position being adapted to be engaged with said switch means so as to switch said first driving means to the high speed operating state;

(iii) a locking means for holding said second actuating member in said locking position when said tape lead-out pins move away from their non-operative position;

(iv) a high speed feed means which holds said second driving means so as to prevent said winding reel supporting disc from being driven, said high speed feed means being adapted to release said second driving means in response to actuation of said high speed feed button so that said second driving means promptly engages with said winding reel supporting disc whenever said second actuating member is released from the locking position;

(v) a first rewind means adapted to be actuated in response to the movement of said second actuating member from the original position to the locking position so as to engage said first driving means with said supply reel supporting

disc whenever said first actuating member returns from the active position; and

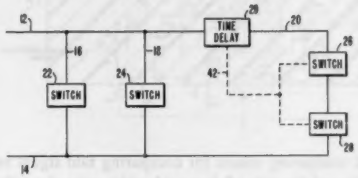
(vi) a second rewind means adapted to be operated in response to actuation of said rewind button so as to actuate said first rewind means.

4,121,268

ELECTROLYTIC CELL VACUUM SWITCHING SYSTEM

Robert M. Hruda, Horseheads, and Paul O. Wayland, Montour Falls, both of N.Y., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 10, 1977, Ser. No. 776,326
Int. Cl.[2] H01H *33/66*
U.S. Cl. 361—3 **6 Claims**



3. A vacuum switch system for interrupting low DC voltage, high current circuits, which low DC voltage exceeds the cathode drop potential for the vacuum switch contact material used comprising:

(a) plural parallel electrical circuit paths, with a first path including a single vacuum switch, with at least one other such path including at least two serially connected vacuum switches;

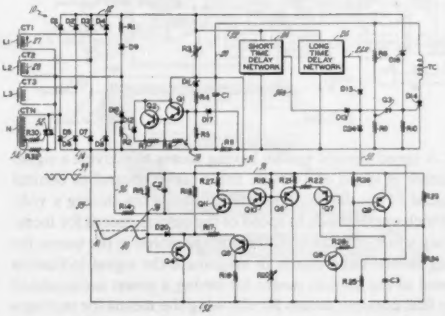
(b) operating means for opening and closing the vacuum switches including means responsive to the opening of the vacuum switch in the first path for simultaneously opening the two serially connected vacuum switches a predetermined time after the vacuum switch in the first path is opened.

4,121,269

GROUND FAULT SIGNAL CIRCUIT FOR CIRCUIT BREAKER TRIP UNIT

Charles F. Hobson, Jr., Southington, Conn., assignor to General Electric Company, New York, N.Y.

Filed May 6, 1977, Ser. No. 794,700
Int. Cl.[2] H02H *3/28*
U.S. Cl. 361—44 **4 Claims**



1. An electronic trip unit for a circuit breaker operating to protect a distribution circuit against both overcurrent and ground fault conditions, said trip unit comprising, in combination:

A. a current transformer linked to each conductor of the distribution circuit and having a secondary winding in which is developed a current signal proportional to the current flowing in the conductor;

B. first and second buses;

C. a full wave rectifying network including plural pairs of like poled, series diodes connected in parallel between said first and second buses, one corresponding side of each transformer winding connected to the junction between a different diode pair;

D. an additional pair of like poled diodes and a single burden resistor connected in series between said first and second buses, the corresponding other sides of said transformer secondary windings connect in common to the junction between said additional diode pair,

1. whereby, in the event of a ground fault on the distribution circuit, a component of the currents developed in said secondary windings flows through said burden resistor to develop a half-wave rectified signal voltage thereacross directly proportional in magnitude to the distribution circuit current flowing through the ground fault; and

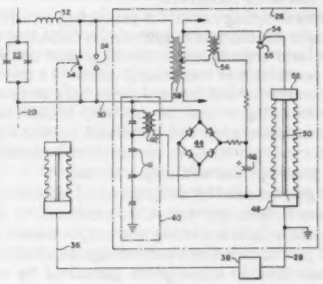
E. ground fault circuitry having its input connected directly across said burden resistor for processing said signal voltage.

4,121,270

SERIES CAPACITOR SYSTEM WITH FORCE FIRING OF PROTECTIVE BYPASS DEVICE

Charles A. Peterson, Bloomington, Ind., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 9, 1977, Ser. No. 767,185
Int. Cl.[2] H02H *7/06*
U.S. Cl. 361—54 **3 Claims**



1. A series capacitor transmission system, with the capability of rapidly bypassing the series capacitor for avoiding subsynchronous oscillation effects on generating equipment connected with the transmission system, comprising:

a capacitor connected in series in an alternating current transmission line;

a bypass device connected in a circuit branch across said capacitor;

means for firing said bypass device including

(a) voltage supply means,

(b) a bypass device firing control circuit for permitting application of energy from said voltage supply means to said bypass device, and

(c) signal initiating means for selectively energizing said firing control circuit;

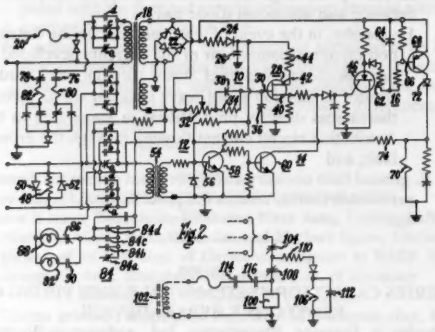
said voltage supply means comprises an inverted capacitive potential device having a series stack of capacitor sections connected between the transmission line and ground potential with one of said capacitor sections proximate the transmission line having a potential transformer primary winding connected in parallel therewith, said potential transformer having a secondary winding connected for

supplying stepped down voltage at line frequency to said firing control circuit.

4,121,271
REVERSE POWER FLOW DETECTOR AND CONTROL CIRCUIT

Reysen Tsai, Houston, Tex., assignor to General Electric Company, Philadelphia, Pa.

Filed Dec. 26, 1973, Ser. No. 427,511
Int. Cl.[2] H02H 3/26
U.S. Cl. 361—82 **2 Claims**



1. A reverse power flow detector and control circuit utilizing solid state components comprising:

a. a voltage sampling circuit for generating a voltage signal including a voltage reference pulse generator connected to the line to be monitored,

b. a current sampling circuit for generating a current signal,

c. an output circuit, said output circuit including a control circuit, said control circuit having a time delay relay to delay connection of said control circuit in a reverse mode until contacts in said forward mode have stopped arcing,

d. a gate including a transistor operative to short said pulses from said pulse generator when said current signal indicates forward power flow, operative between said voltage pulse generator and said output circuit,

1. said gate actuated by a current signal indicating forward power flow to prevent pulses generated by said pulse generator from activating said output circuit and

2. said gate actuated by a current signal indicating reverse power flow to allow pulses generated by said pulse generator to activate said output circuit.

4,121,272
TORSIONAL OSCILLATION ALARM SYSTEM

John F. Wolfinger, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 2, 1977, Ser. No. 792,661
Int. Cl.[2] G01H 1/10
U.S. Cl. 361—236 **5 Claims**

1. An alarm system for generating alarms when torsional oscillations of a rotating shaft exceed predetermined limits comprising:

(a) means for providing a torsional oscillation voltage signal representative of the magnitude of oscillation of said shaft;

(b) means for providing a first reference voltage representative of a first maximum magnitude of oscillation;

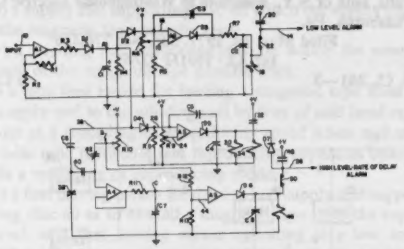
(c) first comparing means for comparing said torsional oscillation voltage signal against said first reference voltage and for generating a low level alarm signal when said torsional oscillation signal exceeds said first reference voltage for a predetermined length of time;

(d) means for providing a second reference voltage representative of a second maximum magnitude of oscillation;

(e) second comparing means for comparing said torsional oscillation signal against said second reference voltage and for generating an output signal when said torsional oscillation signal exceeds said second reference voltage;

(f) means activated by said output signal for generating a signal representative of the rate of decay of said torsional oscillation signal;

(g) means for providing a third reference voltage representative of a minimum required rate of decay; and

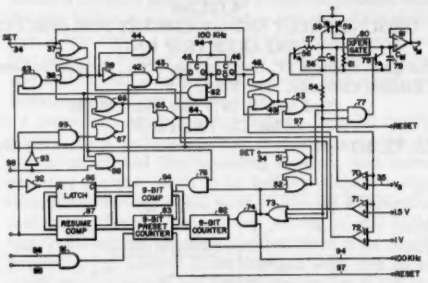


(h) third comparing means for comparing said signal representative of the rate of decay of said torsional oscillation signal against said third reference voltage and for generating a high level alarm signal when the rate of decay is less than a predetermined value as set by said third reference voltage.

4,121,273
CRUISE CONTROL METHOD AND APPARATUS

Robert Benjamin Jarrett; Wilson David Pace, both of Tempe, and Howard Fredrick Weber, Scottsdale, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 14, 1977, Ser. No. 759,516
Int. Cl.[2] B60K 31/00
U.S. Cl. 361—239 **12 Claims**



11. A speed control system having means to provide a signal indicative of speed of a device and a servo control to control the speed of the device, comprising: means for storing a voltage which corresponds to speed of the device; means for incrementing a first counter until the voltage stored in the means for storing substantially equals in magnitude the signal indicative of speed of the device; means for saving a count accumulated in the first counter; means for allowing the means for storing a voltage to be repeatedly charged for a period of time corresponding to the count saved in the means for saving a count; and means for comparing the stored voltage against a signal indicative of present speed of the device so that a correction can be made to speed of the device if the present speed of the device is different from a predetermined speed.

4,121,274

SELF-HEALING ELECTRICAL CAPACITOR AND METHOD FOR ITS PRODUCTION

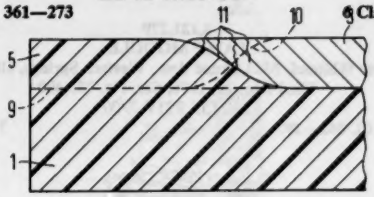
Reiner Simson, Heidenheim; Karl-Heinz Schindhelm, Herbrechtingen, and Werner Vogel, Heidenheim, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Apr. 18, 1977, Ser. No. 788,313

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1976, 2619260

Int. Cl.[2] H01G 4/24

U.S. Cl. 361—273 6 Claims



1. A self-healing AC electrical coiled capacitor comprising coiled layers of polypropylene films provided with metallizations applied onto the films such that exposed margins result along longitudinal edges of the films, the exposed margins being impregnated by a liquid, and the polypropylene films being swelled only in the region of the impregnated exposed margins, the swelled exposed margins preventing access of air to the metallizations in the finished coiled capacitor.

4,121,275

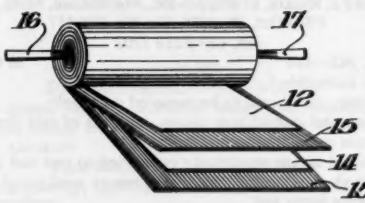
ESTER DIELECTRIC FLUID CONTAINING TERT-BUTYL ANTHRAQUINONE

Sidney D. Ross, Williamstown, and Raynor Linzey, Adams, both of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Jun. 27, 1977, Ser. No. 810,131

Int. Cl.[2] H01B 3/20; C10M 3/20, 3/14

U.S. Cl. 361—319 2 Claims



1. An AC capacitor comprising a plurality of electrodes separated by a dielectric spacer and a dielectric fluid composition impregnating said spacer and consisting of diisononylphthalate, up to 1% of 3,4-epoxycyclohexylmethyl-3,4-epoxycyclohexanecarboxylate as stabilizer, and up to 2% tert-butylanthraquinone to increase corona start voltage.

4,121,276

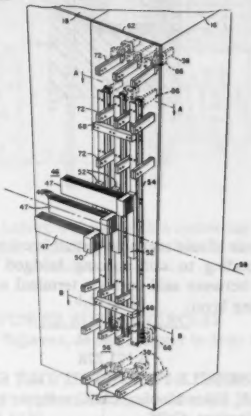
ELECTRICAL SWITCHBOARD APPARATUS WITH CENTER FED VERTICAL RISER BUS

George N. Kovatch, Monroeville Borough, and Richard Rosey, Plum Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 30, 1976, Ser. No. 755,705

Int. Cl.[2] H02B 1/04

U.S. Cl. 361—342 13 Claims



1. Electrical power distribution apparatus comprising:

a cabinet structure;

a multiphase horizontal main bus disposed within said structure and having a plurality of individual horizontal phase conductors vertically spaced one above the other;

a multiphase vertical riser bus disposed within said structure and having a plurality of individual vertical phase conductors horizontally spaced one beside the other;

circuit interrupter apparatus having its input connected to said multiphase vertical riser bus and its output connected to an electrical load;

a plurality of tie members, one tie member being connected to each vertical phase conductor; and

means for connecting each horizontal phase conductor to the tie member of its associated vertical phase conductor, so as to symmetrically locate each tie member with respect to the horizontal centerline of said horizontal main bus.

4,121,277

HIGH CURRENT PROTECTION IN A SOLID ELECTROLYTIC CAPACITOR

Ferdinand Hilbert, Heidenheim, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Jun. 28, 1976, Ser. No. 700,533

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1975, 2531438

Int. Cl.[2] H01G 9/00

U.S. Cl. 361—433 8 Claims

1. A solid electrolytic capacitor comprising:

(a) an anode;

(b) an oxide layer on said anode as a dielectric;

(c) a semiconductive electrolyte on said oxide layer as a cathode;

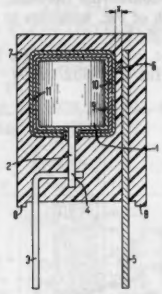
(d) a cathode contacting layer on said electrolyte;

(e) an anode terminal connected to said anode;

(f) a cathode terminal;

(g) a plastic case with said anode, said cathode, and said cathode contacting layer mounted therein as a central member, said cathode terminal being spaced from said central member to form a spacing therebetween;

(h) a meltable circuit breaker bridged between said cathode terminal and said cathode contacting layer in said spacing; and



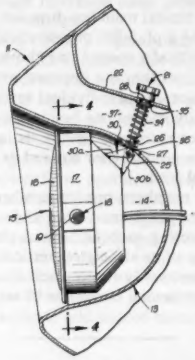
(i) a diameter of said meltable circuit breaker approximately corresponding to said spacing bridged by said circuit breaker between said cathode terminal and said cathode contacting layer.

4,121,278

MOTORCYCLE HEADLIGHT TILT CONTROL

Ronald L. Doll, Santa Monica, Calif., assignor to Spirit of America, Inc., Gardena, Calif.

Filed Apr. 4, 1977, Ser. No. 784,034
Int. Cl.[2] B62J 5/00
U.S. Cl. 362—72 **7 Claims**



1. In combination with motorcycle headlight structure and wind deflecting fairing,

(a) support means supporting the headlight structure to the fairing so that the headlight is tiltable to tilt the headlight forward beam up and down, said structure including a lamp casing,

(b) a manual control on the fairing, and

(c) other means connected with the headlight structure and the manual control to controllably tilt the headlight in response to manual operation of said control,

(d) there being a spring acting to transmit force biasing said headlight structure in a tilt direction,

(e) said other means including interconnection structure including first and second parts that are interconnected so that rotation of the manual control displaces said parts to tilt the headlight as aforesaid,

(f) the fairing including a re-entrant portion receiving the headlight structure, and a shelf spaced above the level of said re-entrant portion, said manual control located above said shelf, there being openings in the shelf and re-entrant portion of the fairing to receive said interconnection structure,

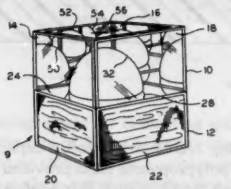
(g) said other means including multi-legged brackets integral with the casing and supporting said first part to swivel about a lateral axis as the headlight is tilted, there being trunnion means on said first part and received in at least one bracket carried opening, the trunnion means having an edge to frictionally engage a bore defining said opening in response to force exertion by the spring, thereby to hold the casing in selected tilt position.

4,121,279

LAMP MODULE

J. Eric Whitesel, 5313 Grand Ave., Western Springs, Ill. 60558

Filed Dec. 29, 1976, Ser. No. 755,490
Int. Cl.[2] F21V 7/00
U.S. Cl. 362—297 **7 Claims**



1. A household type of lamp for internal lighting within a building, said lamp comprising a primary light source having first and second sections, the first of said sections including means for supporting the base of a light bulb with its dome projecting upwardly above said first section and into said second section, said second section comprising partially light-transmitting mirror means surrounding the dome of said bulb for reflecting ambient light outwardly and the light of said bulb inwardly and for transmitting light outwardly, the area between said dome and said mirror means being free of image-blocking structures, whereby said dome is not easily seen when said bulb is not lit and the image of said dome is internally reflected without distortion and the ambient area is lit, when the bulb lit, the lit bulb being reflected inwardly without image distortion an infinite number of times within said second section, said first and second sections have a common image-reflecting panel which closely surrounds the circumference of said dome, conceals the base of said light bulb and reflects the image of said dome without image distortion into said second section.

4,121,280

ARTICULATED LIGHT FIXTURE

Earle F. Chapman, Summer St., Marshfield, Mass. 02051, and Bernard J. Ruskin, 17 Sheldon Rd., Marblehead, Mass. 01945

Filed Oct. 28, 1976, Ser. No. 736,557
Int. Cl.[2] F21S 1/02
U.S. Cl. 362—418 **10 Claims**

1. An extensible light fixture comprising:

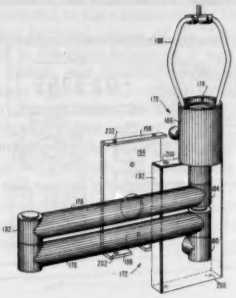
(a) a base configured to be mounted on a wall;

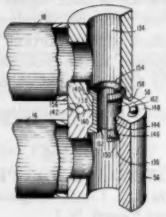
(b) first and second arm means, one end of said first arm means connected to said base;

(c) socket means operatively connected to one end of said second arm means, said socket means configured to receive a lamp; and

(d) a first rotatable swivel joint having a pair of cooperating rotatable members that are juxtaposed in mating relationship and are constrained for maximum relative rotation of 360°, one of said members operatively connected to the other end of said first arm means and the other of said members connected to the other end of said second arm means, each said member having an internal shoulder, a first pin engaging each said interval shoulder of each said

member, said members constrained for free rotational movement and fixed against vertical separation relative to one another by said first pin, one face of said one member adjacent one face of said other member, said one face of said one member formed with a first race and said one face of said other member formed with a second race, said first and second races of substantially equal length and disposed in congruent arcuate paths that are coaxial with a rotational axis of said first swivel joint, portions of said





first race aligned with portions of said second race, a first channel formed between said aligned portions of said races, a first slidable member received in said first channel, said first and second races having an approximate length of the sum of pi multiplied by a radius of said first race and the arcuate length of said first slidable member, the relative rotation of said one member and said other member limited to a maximum of one complete revolution, said slidable member moved a maximum distance of 180° as said members are relatively rotated 360°.

4,121,281

DIRECT CURRENT CONVERTER

Julius Banga, Munich, Germany, assignor to Messerschmitt-Bölkow-Blohm Gesellschaft mit beschränkter Haftung, Munich, Germany

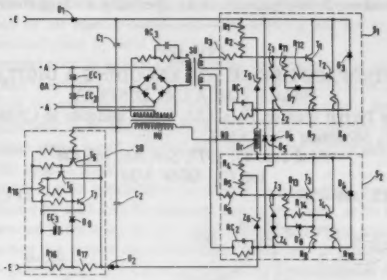
Filed Oct. 3, 1977, Ser. No. 838,455

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1976, 2648030

Int. Cl.² H02M 3/335

U.S. Cl. 363—17 **5 Claims**

1. In a dc converter with a push-pull oscillator in a bridge connection of a design symmetrical to the bridge diagonal, wherein each symmetrical half in one bridge branch includes a capacitor and in the other bridge branch includes a transistor switch stage, the control path of which is inductively fed back from the bridge diagonal, said converter being equipped with a transformer having a rectifier on the output side, the improvement being that between transistor switching stages of



the symmetrical halves, a choke with a center tap is arranged, the bridge diagonal extending from the choke center tap.

4,121,282

POWER SUPPLY CIRCUIT

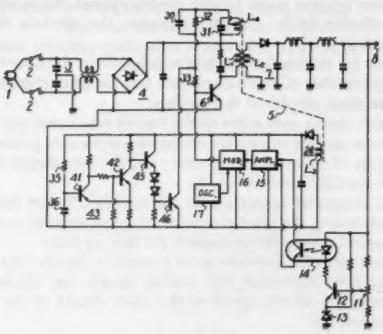
Mitsuo Ohsawa, Fujisawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 17, 1977, Ser. No. 759,650

Claims priority, application Japan, Jan. 21, 1976, 51-6129; Jan. 21, 1976, 51-6130

Int. Cl.² H02M 3/335

U.S. Cl. 363—21 **7 Claims**



1. A power supply circuit comprising:

a first rectifying circuit for producing a first DC voltage when AC power is supplied thereto;

a transformer having primary, secondary, tertiary and fourth windings, said primary winding being connected to said first rectifying circuit;

a second rectifying circuit connected to said secondary winding so as to produce a DC output voltage in response to an output voltage generated on said secondary winding;

a detecting circuit for detecting said DC output voltage;

modulating means for generating a modulated signal in response to an output signal of said detecting circuit;

an active switching element connected in series with said primary winding of said transformer and controlled by said modulated signal so as to chop said first DC voltage applied to said transformer;

an oscillation circuit connected to said fourth winding of said transformer and to said active switching element for generating an oscillation signal in said transformer, said oscillation circuit further including means for feeding back a signal produced in said fourth winding to said active switching element to cause self oscillation of the latter; and

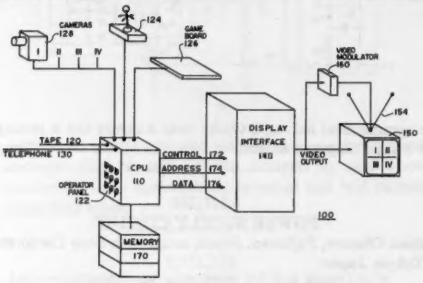
a third rectifying circuit connected to said tertiary winding of said transformer for receiving said oscillation signal and converting the same to a DC voltage which is supplied to said modulating means as an operating voltage thereof.

4,121,283

INTERFACE DEVICE FOR ENCODING A DIGITAL IMAGE FOR A CRT DISPLAY

James Terrell Walker, Palo Alto, Calif., assignor to Cromemco Inc., Mountain View, Calif.

Filed Jan. 17, 1977, Ser. No. 760,106
Int. Cl.[2] G06F *3/14*
U.S. Cl. 364—200 **31 Claims**



1. An interface device for connection between a computer and a CRT device for processing predetermined blocks of display data from predetermined locations in a memory in the computer to form pixels having predetermined characteristics in the display fields of the CRT device, the interface device comprising:

means for storing format data which defines the dimensions and number of fields displayed, and the characteristics of the pixels displayed therewithin;

control means responsive to the format when read out from the means for storing for coordinating the data processing cycle of the computer memory and the data display cycle of the CRT device;

pixel controller responsive to the read out format data for controlling the pixel characteristics and responsive to the control means for processing the display data;

video means for converting the processed display data from the pixel controller into analog signals and adapted to apply the analog signals to the video circuit of the CRT device; and

memory address means for addressing blocks of display data corresponding to the display fields of the CRT device, having a first address counter responsive to the format data for incrementing the least significant bit (LSB) portion of the memory address to the computer memory which defines the first dimension of each field displayed on the CRT device, and a second address counter responsive to the format data for incrementing the next LSB portion of the memory address to the computer memory which defines the second dimension of each field displayed on the CRT device.

4,121,284

COMPUTERIZED SYSTEM FOR OPERATOR INTERACTION

Gilbert P. Hyatt, 11101 Amigo Ave., Northridge, Calif. 91324

Filed Sep. 11, 1972, Ser. No. 288,247
Int. Cl.[2] G06F *3/02, 11/00, 7/00*; G08C *1/00*
U.S. Cl. 364—200 **38 Claims**

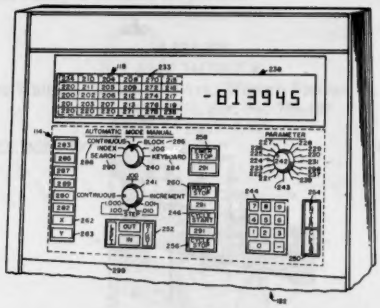
1. An operator control system comprising:

a switch for generating a switch signal having a switch bounce signal portion and a switch information signal portion;

a command memory for storing commands related to processing of the switch signal;

an information memory for storing processed information related to the switch information signal portion; and

processing means for processing information in respone to said stored commands; said processing means including means for receiving the switch signal, means for processing the received switch signal under control of said stored commands to separate the switch information signal portion from the switch bounce signal portion, and storing means for storing information related to said separated switch information signal portion in said information memory in response to the processing of said received switch signal by said received switch signal processing means.

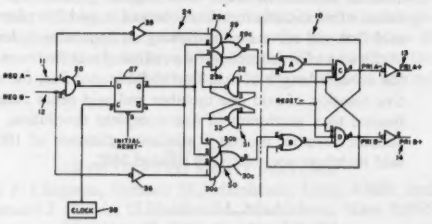


4,121,285

AUTOMATIC ALTERNATOR FOR PRIORITY CIRCUIT

Frank K. Chen, Santa Ana, Calif., assignor to Ultronic Systems Corporation, Mount Laurel, N.J.

Filed Apr. 1, 1977, Ser. No. 783,868
Int. Cl.[2] G06F *9/18*
U.S. Cl. 364—200 **8 Claims**



1. In a data processing device having at least two service requesting ports and a like number of service answering ports, said device having a priority circuit with first and second channels connected to said answering ports, respectively, each of said channels having an AND gate with a plurality of input lines and an output line connected to an answering port, the output line of each of said gates being connected to one of the input lines of the AND gate of the other channel whereby the enablement of one of said gates disables the other, reset means connected to an input line of each of said gates for cyclically resetting the latter, the improvement of a circuit for distributing successive simultaneous service requests at said requesting ports to different channels of said priority circuit comprising

first AND gate means having input terminals connected to said requesting ports, respectively, and having an output terminal, said first gate means being responsive to simulta-

neous signals at said requesting ports for producing a signal at said output terminal,

second and third AND gate means, each having a plurality of input terminals and an output terminal, the output terminals of said second and third gate means being connected to the inputs, respectively, of said priority circuit channels, said requesting ports being connected to inputs of said second and third gate means, respectively,

bistable means having a plurality of input and output terminal means and first and second operating states,

said input terminal means of said bistable means being operatively connected to the outputs of said first gate means and said output terminal means of the bistable means being connected to the input terminals of said second and third and gate means, said bistable means being responsive to simultaneous signals in the outputs of said first AND gate means to change from the first operating state to the second operating state, and

means responsive to the outputs of said first and second priority circuit channels and operatively connected to the inputs of said second and third gate means for blocking the input from the requesting port to the immediately previously served priority channel when successive service requests are simultaneously applied to said requesting ports.

4,121,286

DATA PROCESSING MEMORY SPACE ALLOCATION AND DEALLOCATION ARRANGEMENTS

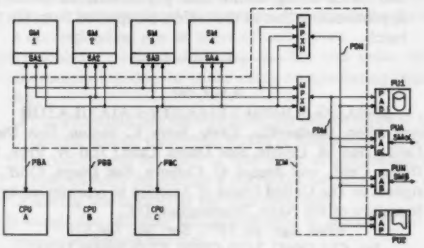
Peter Charles Venton, Wimborne; Michael Blench, Maidenhead; Anthony Keith Sutherland, Reading, and Kenneth James Hamer Hodges, Wimborne, all of England, assignors to Plessey Handel und Investments AG, Zug, Switzerland

Filed Oct. 8, 1976, Ser. No. 730,840

Claims priority, application United Kingdom, Oct. 8, 1975, 41139/75

Int. Cl.[2] G06F *11/00*

U.S. Cl. 364—200 **6 Claims**



1. A process for controlling the allocation and deallocation of memory space in a data processing system of the type including a plurality of processor units and at least one memory for holding information in segments, each segment including data, program code or lists of segments and each processing unit including a plurality of capability registers each arranged to store segment descriptor information indicative of the base and limit addresses in the memory of a segment and each processing unit further including capability register loading means and first means for addressing at a defined entry an information segment which contains a master capability table having an entry for each segment in the system, each entry including information defining the base and limit addresses of a corresponding segment together with a first and a second indicator bit and second means for reading the base and limit information from the defined entry addressed by said first means into the capability register to be loaded and third means for setting the first and second indicators in the defined entry addressed by said first means and, fourth means for testing the state of the first and second indicators wherein one of the processing units in the data processing system is arranged to perform periodically a sequence of operational steps to detect segments which are no longer being used, wherein said sequence comprises:

a first step in which the first indicator and the second indicator of all master capability table entries are set to be a second state by said third means;

a second step in which each master capability table entry is read in sequence by said second means and the state of the first indicator is tested by said fourth means and if the first indicator is in the first state the second indicator in the same status word is tested and if the second indicator is in the second state;

a third step is performed in which each second indicator found by said fourth means, in the second step, to be in the second state is set by said third means to the first state and when the master capability table entry read is relative to a segment storing a list of segments the first indicator of the status word of each of those segments listed is set to the first state and

a fourth step performed only when all entries in the master capability table have been processed by the second step and in which each master capability table entry is tested by said fourth means and a segment is indicated as suitable for release only if the first indicator thereof is in the second state.

4,121,287

ALARM FILTERING IN A GROUND PROXIMITY WARNING SYSTEM

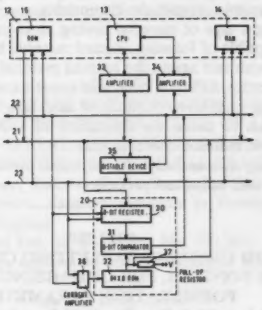
Jean-Claude Leal, Versailles; Henri Vannetzel, Bourg la Reine; Jean-Claude Grima, Chatillon, and Guy Albert Jules David, Thiais, all of France, assignors to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed Jun. 28, 1977, Ser. No. 810,896

Claims priority, application France, Jul. 1, 1976, 76 20044

Int. Cl.[2] G01C *5/00*

U.S. Cl. 364—461 **7 Claims**



1. A ground proximity warning system for determining the proximity of an aircraft with respect to the ground utilizing flight positional input parameters, comprising:

means for calculating the position of the aircraft with respect to a plurality of specified flight warning mode envelopes;

means for providing information on the aircraft's actual position;

means for comparing said calculated position with said information on the aircraft's actual position during successive sampling periods, and producing predetermined alarm condition signals if the aircraft has penetrated a respective one of said flight warning mode envelopes constituting an alarm condition; and

filter means connected to said comparing means for filtering said alarm condition signals and for generating a plurality of alarm generating signals depending upon the alarm condition signal during the continuing flight of the aircraft in comparison with predetermined maximum and

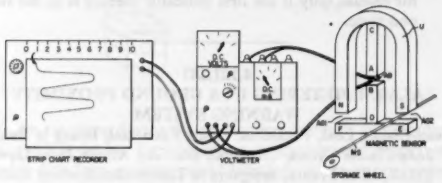
minimum alarm condition signal levels; including means for incrementing each flight warning mode alarm condition signal by a constant during each sampling period when said alarm condition is present; means for producing a predetermined one of said alarm generating signals when the predetermined maximum level of said alarm condition signal is reached by the incremented value; means for decrementing said alarm condition signal by a constant during each sampling period when its magnitude is between said maximum and minimum levels and the corresponding alarm condition ceases to exist; and means for resetting said alarm condition signal to zero instantaneously when its magnitude is below said minimum level and said alarm condition ceases to exist.

4,121,288

MAGNETIC TAPE TYPE SENSORS, METHOD AND APPARATUS USING SUCH MAGNETIC TAPE SENSORS

William M. Hickam, Churchill Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 5, 1976, Ser. No. 655,349
Int. Cl.[2] G06F *15/20*; G01N *27/00*
U.S. Cl. 364—497 **27 Claims**



18. A method of recording as a function of time the magnitude of a process variable involving an industrial process and a chemical agent generated thereby in amount related to said process variable magnitude, comprising:

selecting a tape of material having an inorganic constituent susceptible of forming reacted material by chemical reaction with said agent, the reacted material having magnetic properties different from said constituent;

exposing successive portions of said tape to said industrial process to cause the formation of variable amounts of reacted material thereon; and

retrieving successively the exposed portions of said tape from said industrial process.

4,121,289

METHOD INVOKING TABLETTING COMPRESSION FORCE CONTROL FOR OPTIMIZING TABLETTED FORMULATION PARAMETERS

Donald Melvyn Stiel, Pine Brook, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 581,459, May 28, 1975, abandoned. This application Dec. 14, 1976, Ser. No. 750,490
Int. Cl.[2] G06F *15/46*
U.S. Cl. 364—552 **1 Claim**

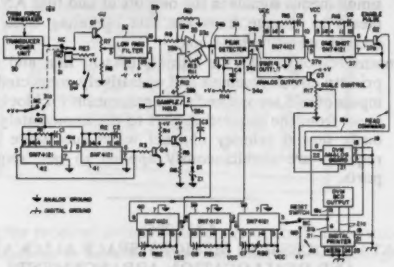
1. A method for establishing, within pre-established limits of a desired value, tablet-to-tablet and batch-to-batch consistency of a particular physio-chemical parameter of a tabletted formulation, said parameter being release rate of drug substance relative to desired biological response and having a dependency on tablet hardness, said formulation being particulate material intended to be compacted into tablets on a suitable tablet press, comprising:

(a) preliminarily compressing on the tablet press from a first batch of said formulation at least one tablet of the formulation at each of a plurality of different selected tabletting compression forces and obtaining from the tabletting events of said at least one tablets respective electrical signals representative of tablet formation force information and including maximum compression force information;

(b) isolating from said tablet formation force information the maximum compression force information associated to each preliminarily compressed tablet;

(c) analyzing at least one tablet preliminarily compressed at each of the selected compression forces to derive the respective values of the physio-chemical parameter thereof and relating said values of the parameter respectively to the corresponding maximum compression force of those tablets analyzed;

(d) selecting from said values of the physio-chemical parameter a value within said pre-established limits which approximates the desired value of said parameter;



(e) setting the tablet press at that compression force setting which corresponds to the selected value of said physio-chemical parameter and compressing the remainder of the first batch of the formulation at that setting of the tablet press; and

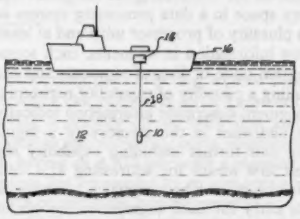
(f) performing (a) – (e) for a second batch of the formulation, the maximum compression force setting of the tablet press selected thereby for said second batch which corresponds to said parameter of the tablets compacted from the second batch being within said pre-established limits and approximating that of the tablets compacted from the first batch.

4,121,290

ANALOG SOUND VELOCITY CALCULATOR

Royce Allen, Centerville, Utah; Jerry L. Sutton, San Diego, Calif.; Dan M. Griffin, San Diego, Calif.; Hal W. Frye, San Diego, Calif., and Joseph G. Colborn, San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 18, 1977, Ser. No. 788,371
Int. Cl.[2] G06G *7/78*; G01H *5/00*; H04B *13/00*
U.S. Cl. 364—565 **12 Claims**



1. Apparatus for enabling the passive determination of the velocity of sound at various levels in a liquid media comprising:

means for passively sensing the temperature, conductivity, and depth of the liquid media at various levels;

means for representing said sensed temperature in the form

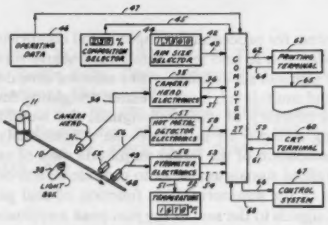
of a first voltage, for representing said sensed conductivity in the form of a second voltage, and for representing said sensed depth in the form of a third voltage;

analog calculating means receiving said first, second, and third voltages for providing an analog output voltage in real time which represents the velocity of sound at said levels.

4,121,291
LINEARITY CORRECTION SYSTEM FOR ELECTRO-OPTICAL GAGE

Joel L. Hoffner, and Tom L. Galanis, both of Bethlehem, Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Mar. 17, 1977, Ser. No. 778,513
Int. Cl.² B21B *37/00*; G06F *15/46*
U.S. Cl. 364—571 **18 Claims**



1. A linearity correction system for an electro-optical system which gages a dimension of a moving bar, comprising:

(a) electronic camera head means aimed to receive an image of the moving bar and generate a raw camera signal, said raw camera signal requiring linearity correction for one or more linear and/or nonlinear errors from optical and/or electronic sources, excluding linear optical errors;

(b) electronic circuit means including means for processing the raw camera signal to produce a bar size pulse having a corresponding one or more of said errors;

(c) calculator means assimilating the bar size pulse and a corresponding one or more error-compensating signals for:

.1 compensating the bar size pulse for one or more of said optical and/or electronic errors in response to a corresponding one or more of said error-compensating signals, thereby producing a corrected bar size pulse, and

.2 storing the corrected bar size data; and

(d) means for utilizing the stored data to indicate and/or record corrected bar size.

4,121,292
ELECTRO-OPTICAL GAGING SYSTEM HAVING DUAL CAMERAS ON A SCANNER

Tom L. Galanis, Bethlehem; Joel L. Hoffner, Johnstown; John C. Clymer, Bethlehem, all of Pa.; Richard S. Hostetter, Jr., Orchard Park, N.Y.; Duane T. Jones, Coopersburg, Pa., and Ronald W. Yerkes, Orchard Park, N.Y., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Mar. 17, 1977, Ser. No. 778,809
Int. Cl.² B21B *37/00*; G06F *15/46*
U.S. Cl. 364—571 **24 Claims**

1. An electro-optical system for gaging two dimensions of a moving bar at various peripheral positions of the bar, comprising:

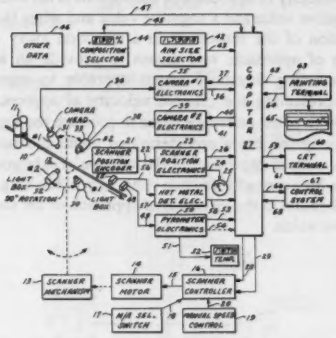
(a) first and second electronic camera head means aimed to receive first and second images of the moving bar and generate corresponding first and second raw camera signals, each raw camera signal having at least one error;

(b) scanner means adapted to scan the first and second electronic camera head means about the lateral profile of the bar a prescribed angular displacement while generating a scanner position signal;

(c) means for controlling movement of the scanner means;

(d) electronic circuit means including means for processing the first and second raw camera signals to produce corresponding first and second bar size pulses, each first and second bar size pulse having at least one said error;

(e) calculator means assimilating the first and second bar size pulses, the scanner position signal and at least one corresponding error-compensating signal for:



1. compensating each bar size pulse for one or more sources of error as a function of a corresponding one or more error-compensating signals, thereby to produce corresponding first and second corrected bar size pulses,

2. plotting bar profile using corrected first and second bar size pulses and scanner position signals, and

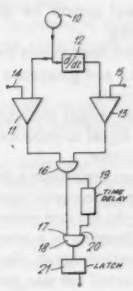
3. storing the bar profile data and optionally the corrected first and second bar size data; and

(f) means for utilizing the stored data to indicate and/or record a corrected bar profile and, if desired, each bar size measurement.

4,121,293
INDICATION MEANS FOR INDICATING SUITABLE CONDITIONS FOR THE TRANSFER OF LOADS BETWEEN TWO STATIONS MOVABLE RELATIVE TO EACH OTHER IN A VERTICAL PLANE

Andrew Guy Kerr, Edinburgh, Scotland, and Robert Arthur Morley, Southport, England, assignors to Ferranti Limited, Hollinwood, England

Filed Feb. 25, 1977, Ser. No. 772,254
Claims priority, application United Kingdom, Feb. 28, 1976, 07939/76
Int. Cl.² B66C *15/06*
U.S. Cl. 364—463 **6 Claims**



1. Indication means for indicating conditions suitable for

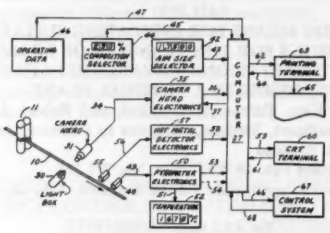
lifting a load from a first of two stations, movable relative to each other in at least a vertical plane, by a crane carried by the second station, the crane being adapted to permit a hook assembly, when attached to the load on the first station, to follow the motion of the first station prior to lifting of the load, said indication means comprising sensing means for sensing relative movement between the stations to produce signals representative of the values of relative velocity and relative acceleration of the stations, and means responsive to the magnitude and sense of said signals to provide an indication signal when the relative velocity of approach of the stations is between a maximum positive value and a negative value and when the relative acceleration of the stations is in a direction away from the direction of approach, said means to provide an indication signal including threshold means operable to compare the signal representing the relative velocity of approach of the stations with a first reference value to produce the signal when said velocity reaches a predetermined value and operable to compare a signal representing the relative acceleration of the stations with a second reference value to provide a signal when the acceleration in the direction of approach of the stations has a negative value.

4,121,294

ELECTRO-OPTICAL GAGING SYSTEM

Tom L. Galanis, Bethlehem; Joel L. Hoffner, Johnstown; John C. Clymer, Bethlehem, and Duane T. Jones, Coopersburg, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Mar. 17, 1977, Ser. No. 778,810
Int. Cl.[2] B21B *37/00*; G06F *15/46*
U.S. Cl. 364—571 **21 Claims**



1. An electro-optical system for gaging a dimension of a moving bar, comprising

(a) electronic camera head means aimed to receive an image of the moving bar and generate a raw camera signal having at least one error;

(b) electronic circuit means including means for processing the raw camera signal to produce a bar size pulse having at least one said error;

(c) calculated means assimilating the bar size pulse and at least one corresponding error-compensating signal for:

1. compensating the bar size pulse for one or more sources of error as a function of a corresponding one or more error-compensating signals, thereby to produce a corresponding corrected bar size pulse,

2. storing the corrected bar size pulse; and

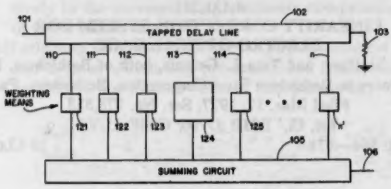
(d) means for utilizing the stored data to indicate and/or record a corrected bar size.

4,121,295

INTEGER WEIGHTED IMPULSE EQUIVALENT CODED SIGNAL PROCESSING APPARATUS

Richard P. Witt, Weston, Mass., assignor to Wittronics, Inc., Weston, Mass.

Filed Apr. 7, 1977, Ser. No. 785,331
Int. Cl.[2] G06F *15/34*
U.S. Cl. 364—724 **17 Claims**



1. A system for processing an input signal comprising coding means responsive to said input signal for linearly transforming said input signal in accordance with a selected time distribution and selected multi-level, integer related weighting functions to produce a plurality of weighted signals, the weighting functions being selected so as to provide a reasonably uniform power distribution of the larger amplitude ones of said plurality of weighted signals and so as to provide a ratio of the peak amplitude of the autocorrelation function of said plurality of weighted signals to the sum of the non-peak amplitudes thereof which is greater than $n/(n-1)$ where n is the number of terms in said plurality of weighted signals; and

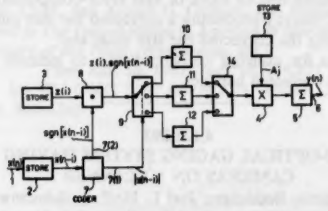
means responsive to said coding means for combining said weighted signals to produce a coded output signal.

4,121,296

DIGITAL SIGNAL PROCESSING ARRANGEMENT

Wilfred André Maria Snijders; Nicolaas Alphonsus Maria Verhoeckx; Petrus Josephus Van Gerwen, and Hendrik Arie Van Essen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 20, 1977, Ser. No. 808,095
Claims priority, application Netherlands, Jul. 12, 1976, 7607682
Int. Cl.[2] G06F *15/34*
U.S. Cl. 364—724 **1 Claim**



1. A digital signal processing arrangement for generating digital output signal samples $y(n)$ which are each formed by the sum of a given plurality of first signal samples $x(n)$ which are each modified by one of a plurality of second signal samples $z(n)$, comprising:

first means for serially supplying first signal samples $x(n)$;

second means for serially supplying second signal samples $z(n)$;

multiplying means having an input circuit and an output circuit;

first coupling means for coupling the input circuit of the multiplying means to the first and second means comprising: means coupled to said first and second means for modifying each of the second signal samples $z(n)$ by an algebraic coefficient sgn $[x(n)]$ which represents the polar-

ity of the first signal sample $x(n)$ associated with the signal sample $z(n)$, for generating signal samples of the form $z(n) \cdot \text{sgn}\,[x(n)]$; a plurality of auxiliary accumulators which each correspond to one of the magnitudes $[x(n)]$ of the first signal samples $x(n)$ and whose outputs are coupled to the input circuit of the multiplying means for multiplying the contents of each of the auxiliary accumulators by the algebraic factor $[x(n)]$ corresponding therewith;

adder means coupled to said multiplying means; and

second coupling means which are controlled by said first signal samples $x(n)$ for applying the signal sample $z(n) \cdot \text{sgn}\,[x(n)]$ to that auxiliary accumulator which corresponds with the magnitude $[x(n)]$ of the first signal sample $x(n)$ associated with the second signal sample $z(n)$.

4,121,297

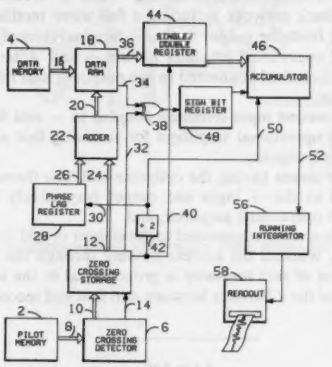
APPARATUS FOR CORRELATING TWO TIME SERIES

James W. Smith, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 691,927, Jun. 1, 1976, abandoned. This application Jun. 15, 1977, Ser. No. 806,784

Int. Cl.[2] G06F *15/34*; G01V *1/36*

U.S. Cl. 364—728 9 Claims



1. Electronic apparatus for correlating two time series of sampled quantities comprising:

sign bit series means having an input for receiving a first of said two time series of sampled quantities and having an output for providing a sign bit representation of said first series, said representation including addresses of zero crossings of said first series and indications of direction of each zero crossing;

data input means having first input for receiving a second of said two time series of sampled quantities, a second input coupled to the sign bit series means output for receiving zero crossing addresses, and an output for providing sampled quantities of said second series which correspond to zero crossings of said first series;

sign modifying means having a first input coupled to said data input means for receiving the sign portion of sampled quantities of said second series, a second input coupled to the sign bit series means for receiving zero crossing direction indications, and an output for providing a modified sign portion; and

summing means coupled to said data input means' output and to said sign modifying means' output for algebraically summing sampled quantities of said second series which correspond to zero crossings of said first time series.

4,121,298

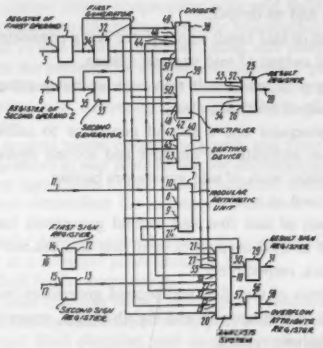
CENTRAL PROCESSING UNIT FOR NUMBERS REPRESENTED IN THE SYSTEM OF RESIDUAL CLASSES

Izrail Yakovlevich Akushsky; Vladimir Mikhailovich Burtsev, both of Moscow; Bulat Esenovich Duisenov, Alma-Ata; Ivan Timofeevich Pak, Alma-Ata, and Anurbek Orymbekovich Zhautykov, Alma-Ata, all of U.S.S.R., assignors to Institut Matematiki i Mekhaniki Akademii Nauk Kazakhskoi SSR, Alma-Ata, U.S.S.R.

Filed Oct. 15, 1976, Ser. No. 732,922

Int. Cl.[2] G06F *7/54*

U.S. Cl. 364—746 25 Claims



1. A central processing unit for numbers represented in the system of residual classes, comprising:

first and second input buses of first and second operands, respectively;

a control bus;

first and second input sign buses of signs of said first and second operands, respectively;

an output result bus;

an output result sign bus;

an output overflow attribute bus;

first and second operand registers for storing the first and second operands, respectively, each of said operand registers having an input and an output,

said inputs of said first and second registers being connected to said first and second buses, respectively;

a modular arithmetic unit, to perform operations of multiplication, subtraction and addition within the range of the system of residual classes, having

first, second, third, and fourth inputs and an output,

said first and second inputs of said modular arithmetic unit being connected to said outputs of said first and second operand registers, respectively,

said third input of said modular arithmetic unit being connected to said control bus;

first and second sign registers, to store the signs of the first and second operands, respectively, each of said sign registers having an

input and an output,

said inputs of said first and second sign registers being connected to said first and second input sign buses, respectively;

an analysis system, to determine the sign of the result of an operation and the overflow attribute, having

first, second, third, fourth, fifth, sixth, seventh, eighth and ninth inputs and first, second and third outputs,

said first and second inputs of said analysis system being connected to said outputs of said first and second operand registers, respectively,

said third and fourth inputs of said analysis system being connected to said outputs of said first and second sign registers, respectively,

said fifth input of said analysis system being connected to said control bus,

said first output of said analysis system being connected to said fourth input of said modular arithmetic unit;

a result register to store the result of operations having first, second, third and fourth inputs and an output,

said first input of said result register being combined with said sixth input of said analysis system and being connected to said output of said modular arithmetic unit,

said output of said result register being connected to said output result bus;

a result sign register to store the sign of the result having an input and an output,

said input of said result sign register being connected to said second output of said analysis system,

said output of said result sign register being connected to said output result sign bus;

a first generator and a second generator to calculate the position attributes of the first and second operands, respectively, each of said generators having an input and an output,

said inputs of said first and second generators being connected to said outputs of said first and second operand registers, respectively,

said outputs of said first and second generators being connected to said seventh and eighth inputs, respectively, of said analysis system;

a multiplier having first, second and third inputs and an output, said output being connected to said third input of said result register, said first input being connected to said control bus, said second input being connected to said output of said second operand register, and said third input being connected to said output of said first operand register;

a divider having first, second, third, fourth and fifth inputs and an output, said output being connected to said second input of said result register, said first input being connected to said control bus, said second input being connected to said output of said second generator, said third input being connected to said output of said second operand register, said fourth input being connected to said output of said first operand register, and said fifth input being connected to said output of said first generator;

a shifting device to shift one of the operands having first, second and third inputs and first and second outputs,

said first input being connected to said control bus,

said second input being connected to said output of said second generator,

said third input being connected to said output of said second operand register,

said first output being connected to said fourth input of said result register, and

said second output being connected to said ninth input of said analysis system;

an overflow attribute register, to store the overflow attribute when adding and subtracting the first and second operands, having an input and an output,

said input being connected to said third output of said analysis system,

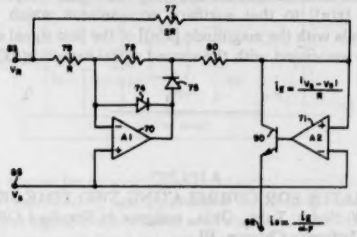
said output being connected to said output overflow attribute bus.

4,121,299

CONSTANT VELOCITY VECTOR GENERATOR EMPLOYING ABSOLUTE VALUE AMPLIFIER CIRCUITS

Michael Lawrence Rieger, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Division of Ser. No. 625,609, Oct. 24, 1975, Pat. No. 4,032,768.
This application Mar. 4, 1977, Ser. No. 774,711
Int. Cl.[2] G06G 7/12, 7/14
U.S. Cl. 364—807 **1 Claim**



1. A circuit for generating a unipolar output current proportional to the absolute value of the difference between a pair of input voltage signals, comprising:

a first operational amplifier having − and + terminals, and a feedback network including a full-wave rectifier connected from the output to the − terminal thereof;

a second operational amplifier having − and + terminals, said + terminal connected to the output of said full-wave rectifier;

first and second input terminals coupled to − said first and second operational amplifiers for receiving first and second input signals;

transistor means having the collector and base thereof connected to the + input and output respectively of said second operational amplifier; and

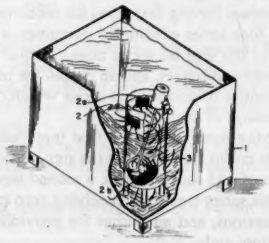
a utilization circuit connected to the emitter of said transistor means, wherein the current flowing through the emitter junction of said transistor is proportional to the absolute value of the difference between said first and second input signals.

4,121,300

BRINE MIXING APPARATUS

Earl Jesse Cosma, Chesterfield, and William Bayard Tuley, Ballwin, both of Mo., assignors to Ralston Purina Company, St. Louis, Mo.

Filed Aug. 25, 1977, Ser. No. 827,522
Int. Cl.[2] B10F 7/16
U.S. Cl. 366—251 **1 Claim**



1. An apparatus for dispersing powdery solids into a large reservoir of liquid; said apparatus comprising:

a. a holding tank;

b. a smaller tank disposed upright within the holding tank and said smaller tank having an open end and an opposite end covered with screen; said open end being directed upwardly and said screen covered end being directed downwardly; the walls of the smaller tank also having at least one strip of screen placed near but not touching the open end of the smaller tank;

c. the apparatus further comprising an agitating means disposed within the smaller container;

whereby the apparatus once filled with liquid and the agitating means once actuated will create a vortex mixing action which upon the solids being poured into the open end of the smaller container will disperse the solids and draw the liquid through the strip of screen and down through the bottom screen which catches all lumps while permitting the dispersed ingredients to flow throughout the volume of the larger container.

4,121,301

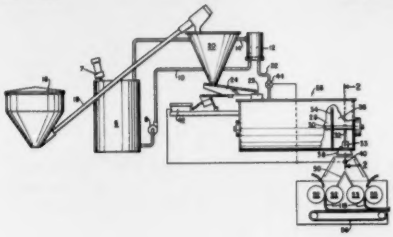
CONTINUOUS-FEED ALIMENTARY PASTE MIXER AND IMPROVED NOODLE-MAKING MACHINE

Leonard De Francisci, New York, N.Y., assignor to De Francisci Machine Corporation, Brooklyn, N.Y.

Filed Jun. 6, 1977, Ser. No. 803,679

Int. Cl.[2] **A47J** *37/00*

U.S. Cl. 99—353 **8 Claims**



1. A continuous-feed alimentary paste mixer for mixing and continuously delivering alimentary paste made from at least a fluid ingredient and a flour ingredient, said mixer comprising:

a mixing vat defining a mixing chamber for receiving ingredients for making alimentary paste, said mixing chamber including an exit port for discharge of alimentary paste;

rotatable mixing means disposed within said mixing chamber for blending alimentary paste ingredients placed within said mixing chamber;

an alimentary paste sensor positioned proximate said exit port and in the flow path of discharging paste for sensing the presence or absence of alimentary paste;

a fluid feeder communicating with said mixing chamber for holding and delivering fluid ingredients of alimentary paste;

fluid control means cooperating with said fluid feeder and responsive to said paste sensor for interrupting the flow of fluid to said mixing chamber unless said paste sensor detects the presence or absence of alimentary paste;

a flour feeder communicating with said mixing chamber for holding and delivering flour ingredients of alimentary paste;

flour control means cooperating with said flour feeder and responsive to said paste sensor for interrupting the flow of flour ingredients to said mixing chamber unless said paste sensor determines the presence or absence of alimentary paste;

means for delivering the fluid and flour to said mixing chamber at a constant predetermined rate;

said fluid feeder comprising:

a first fluid chamber having an exit port communicating with said mixing chamber, an entry port communicating with a second fluid chamber, and overflow removal means for removing fluids exceeding a predetermined level within said first fluid chamber;

a second fluid chamber communicating with said first fluid chamber for holding an excess quantity of fluid ingredients to fill said first fluid chamber to said predetermined level; and

fluid delivery means for delivering fluid from said second fluid chamber to said first fluid chamber at a rate sufficient to maintain said first fluid chamber substantially at said predetermined level.

DESIGN PATENTS

GRANTED OCT. 17, 1978

ERRATA

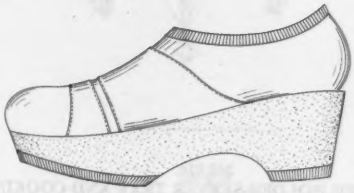
For CLASS	See PATENT NO.
D13–012	249,943
D13–024	249,944
D99–028	249,970

DESIGNS

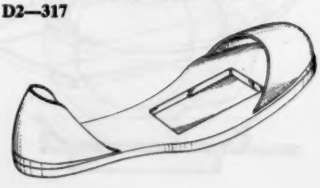
OCTOBER 17, 1978

249,906
DRESS FOR NON-AMBULATORY INDIVIDUALS
Eileen Kohutis, and Ann S. Kohutis, both of 834 Terrace Ave., Woodbridge, N.J. 07095
Filed Apr. 6, 1976, Ser. No. 674,145
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—74

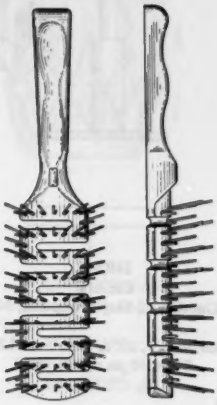
249,907
SHOE
Victor F. Anderson, Wenonah, N.J., assignor to Shell Oil Company, Houston, Tex.
Filed Apr. 12, 1976, Ser. No. 676,161
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—292



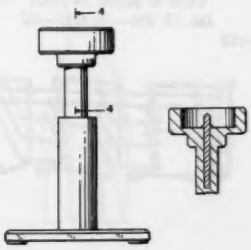
249,908
WALKING SOLE FOR ATTACHMENT TO A CLEATED SHOE
Robert H. Meinhart, 354 Wilbur Rd., Thousand Oaks, Calif. 91360
Filed Oct. 29, 1976, Ser. No. 737,050
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—317



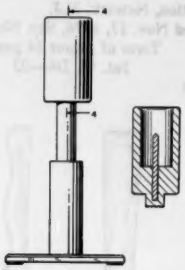
249,909
VENTED HAIR BRUSH
Carl Epstein, Teaneck, N.J., assignor to All American Brush Mfg. Corporation, Newark, N.J.
Filed Nov. 17, 1976, Ser. No. 749,181
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—35



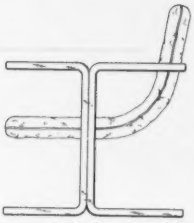
249,910
COMBINED STICK INSERTER AND DISPLAY STAND FOR A FOOD PRODUCT
Edward D. Cottrell, 45 Gail Dr., Cattaraugus, N.Y. 14719
Filed Jul. 12, 1976, Ser. No. 704,346
Term of patent 14 years
Int. Cl. D6—*99*; D20—*02*
U.S. Cl. D6—25



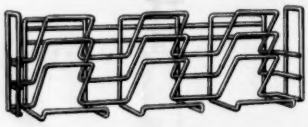
249,911
COMBINED STICK INSERTER AND DISPLAY STAND FOR A FOOD PRODUCT
Edward D. Cottrell, 45 Gail Dr., Cattaraugus, N.Y. 14719
Filed Jul. 12, 1976, Ser. No. 704,431
Term of patent 14 years
Int. Cl. D6—*99*; D20—*02*
U.S. Cl. D6—25



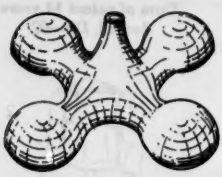
249,912
CHAIR
Steven Douglas Gageby, 12 Hay Camp Rd., North Oaks, Minn. 55110
Filed Aug. 9, 1976, Ser. No. 712,909
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—56



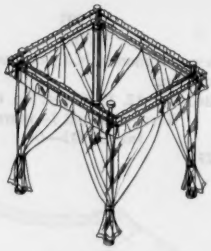
249,913
FILE SHELF
Charles W. Nicely, Wilkes-Barre, Pa., assignor to Metropolitan Wire Corporation, Wilkes-Barre, Pa.
Filed Oct. 26, 1976, Ser. No. 735,163
Term of patent 14 years
Int. Cl. D6—*04*; D19—*02*
U.S. Cl. D6—188



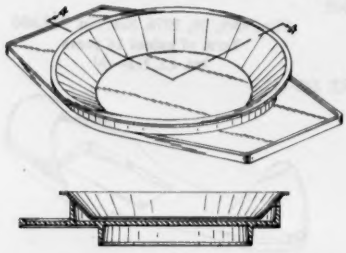
249,914
PEDESTAL
Denis Cairnes, and Derrick John Maltby, both of London, England, assignors to Cairnes Maltby Associates Limited, London, England
Filed Nov. 5, 1976, Ser. No. 739,294
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—196



249,915
BED CANOPY OR SIMILAR ARTICLE
Joe M. Vargas, Alameda, Calif., assignor to John A. Buitrago, Hayward, Calif.
Filed Apr. 22, 1976, Ser. No. 679,159
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—198



249,916
COMBINED HOLDER-SERVER TRAY AND COOKING PAN
Harry F. Collins, Golden Valley, Minn., assignor to Service Ideas, Inc.
Filed Oct. 12, 1976, Ser. No. 731,631
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—3



249,917

COMBINED HOLDER TRAY AND COOKING PAN

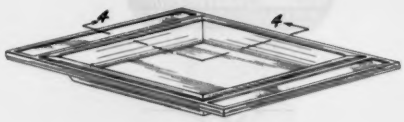
Harry F. Collins, Golden Valley, Minn., assignor to Service Ideas, Inc.

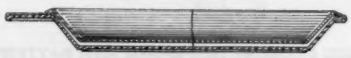
Filed Oct. 15, 1976, Ser. No. 733,008

Term of patent 14 years

Int. Cl. D7—*99*

U.S. Cl. D7—3





249,918

MUG

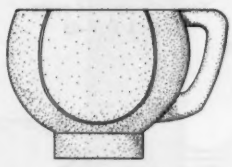
Robert S. Block, 8620 N. Pelham Pkwy., Village of Bayside, Wis. 53024, and John F. Krieger, Grafton, Wis., assignors to Robert S. Block, Village of Bayside, Wis.

Continuation-in-part of Ser. No. 673,131, Apr. 2, 1976, abandoned, which is a division of Ser. No. 416,349, Nov. 16, 1973, Pat. No. D. 239,588. This application Jul. 6, 1976, Ser. No. 702,619

Term of patent 14 years

Int. Cl. D7—*01*

U.S. Cl. D7—9



249,919

TUMBLER OR SIMILAR ARTICLE

James Lloyd Thrush, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

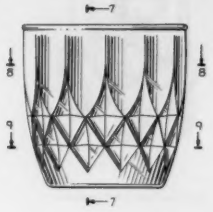
Continuation-in-part of Ser. No. 744,458, Nov. 24, 1976, Pat. No. Des. 247,867. This application Jan. 13, 1977, Ser. No. 759,064

The portion of the term of this patent subsequent to May 16, 1992, has been disclaimed.

Term of patent 14 years

Int. Cl. D7—*01*

U.S. Cl. D7—14



249,920

SERVING BOARD

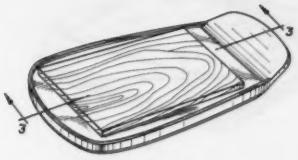
Friedrich Ernest Frieser, 5, Rodney Close, Glen Waverley, Victoria 3150, Australia

Filed Jun. 15, 1976, Ser. No. 696,472

Term of patent 14 years

Int. Cl. D7—*99*

U.S. Cl. D7—19



249,921

CONDIMENT DISPENSER

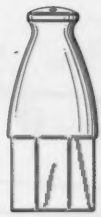
Don Schreckengost, East Liverpool, Ohio, assignor to The Salem China Company, Salem, Ohio

Filed Dec. 13, 1976, Ser. No. 749,976

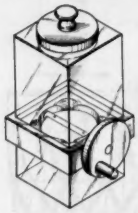
Term of patent 14 years

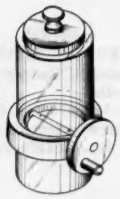
Int. Cl. D7—*06*

U.S. Cl. D7—54



249,922
HERB SEPARATOR
Stewart Hall, 138-10 Jewel Ave., Flushing, N.Y. 11367, and Harley R. Goldman, 417 Roslyn Rd., Roslyn Heights, N.Y. 11577
Filed Dec. 6, 1976, Ser. No. 747,435
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—53





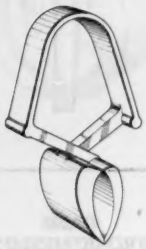
249,923
SCABBARD FOR A KNIFE
Peter K. Bayly, Eltham North, Australia, assignor to Wiltshire Cutlery Company Proprietary Limited, South Melbourne, Australia
Filed May 24, 1976, Ser. No. 689,250
Claims priority, application Australia, Dec. 4, 1975, 68248/75
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—74

249,924
BASKET INSERT FOR A FRYING PAN
Karl Fischer, Oberderdingen, Fed. Rep. of Germany, assignor to E.G.O. Elektro-Geraete Blanc und Fischer
Filed May 25, 1976, Ser. No. 689,826
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—95

249,925
COMBINED CLOSURE DISPENSER AND BATTERY POWERED DRINK MIXER FOR A CONTAINER
Harold W. Rice, Hartsburg, Mo., assignor to McGraw-Edison Company, Elgin, Ill.
Filed Jun. 30, 1976, Ser. No. 701,087
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—131

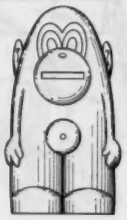
249,926
COMBINED KNIFE, FORK AND SPOON
Woon-Tong Wong, 14 Upton St., Boston, Mass. 02118
Filed Jan. 14, 1977, Ser. No. 759,321
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—149

249,927
BIASED CUP CLAMP
Kiyoshi Takahashi; Akira Takahashi; Kazuo Takahashi, and Takeshi Takahashi, all of Tokyo, Japan, assignors to Polachek, Saulsbury & Hough, New York, N.Y.
Filed Aug. 20, 1976, Ser. No. 716,167
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—395



249,928
AEROSOL CONTAINER
Maximiliaan de Nijs, Pollux 377, Veenendaal, Netherlands
Continuation-in-part of Ser. No. 486,862, Jul. 9, 1974. This application Jul. 19, 1976, Ser. No. 706,150
Claims priority, application Switzerland, May 10, 1974, 58621/74
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—9

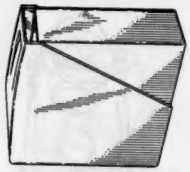
249,929
CANDY DISPENSER
Frank Russert, Palos Heights, Ill., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Jun. 7, 1976, Ser. No. 693,398
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—32



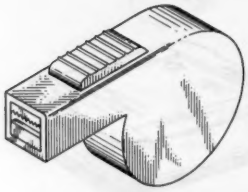
249,930
COMBINED INSULATED FOOD SERVICE TRAY AND COVER THEREFOR
Richard H. Seager, Manchester, Conn., assignor to King-Seeley Thermos Company
Filed Oct. 18, 1976, Ser. No. 733,044
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219

249,931
CANDY DISPENSER
Frank Russert, Palos Heights, Ill., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Jun. 7, 1976, Ser. No. 693,395
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—224

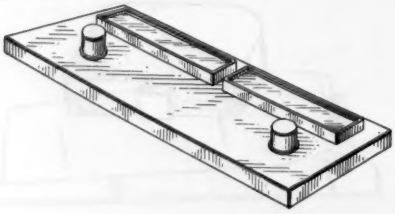
249,932
CANDY DISPENSER
Frank Russert, Palos Heights, Ill., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Jun. 7, 1976, Ser. No. 693,397
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—224



249,933
CANDY DISPENSER
Walter Stern, Wilmette, Ill., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Jun. 7, 1976, Ser. No. 693,404
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—224



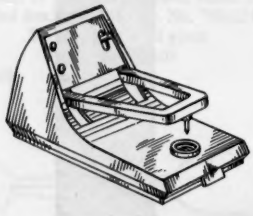
249,934
COVER FOR A FOOD CONTAINER OR THE LIKE
Vincent T. Cullers, Chicago, Ill., assignor to Vince Cullers Advertising, Inc.
Filed Oct. 4, 1976, Ser. No. 729,133
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—254



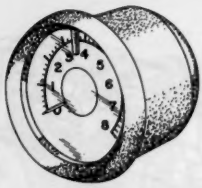
249,935
CONTAINER LID
Robert G. Williams, Graham Dr., Shelbyville, Ind. 46176
Filed Oct. 18, 1976, Ser. No. 733,129
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—254

249,936
ELECTRONIC METRONOME
Takeshi Ishida, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan
Filed Dec. 13, 1976, Ser. No. 749,961
Claims priority, application Japan, Jun. 11, 1976, 51/22439
Term of patent 3½ years
Int. Cl. D10—*03*
U.S. Cl. D10—43

249,937
ELECTRICAL BATTERY TEST INSTRUMENT
David J. Jacobson, 811 The Parkway, Mamaroneck, N.Y. 10243, and Marvin Zaro, 405 E. 63rd St., New York, N.Y. 10021
Filed Dec. 28, 1976, Ser. No. 754,974
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—77

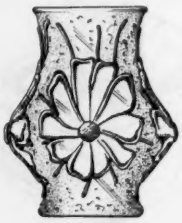


249,938
TACHOMETER
James R. Shaffer, Mt. Prospect, Ill., and Ronald L. Carlson, Marshalltown, Iowa, assignors to Sun Electric Corporation, Chicago, Ill.
Filed Nov. 19, 1976, Ser. No. 743,217
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—98

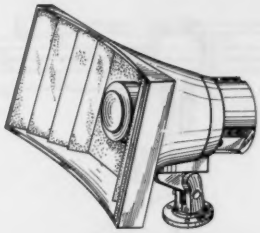


249,939
WRIST STRAP FOR A WATCH AND WRITING IMPLEMENTS
Donald P. Dammons, 11020 S. Eberhart Ave., Chicago, Ill. 60638
Filed Oct. 18, 1976, Ser. No. 733,067
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—2

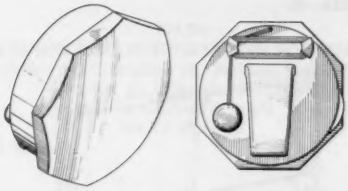
249,940
VASE OR SIMILAR ARTICLE
Frank J. Benes, and James Lloyd Thrush, both of Lancaster, Ohio, assignors to Anchor Hocking Corporation, Lancaster, Ohio
Division of Ser. No. 487,456, Jul. 11, 1974, Pat. No. Des. 243,463. This application Jan. 5, 1976, Ser. No. 646,509
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—151



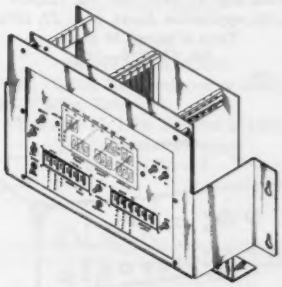
249,941
LOUDSPEAKER
Gerald B. Bremseth, Oklahoma City, Okla., assignor to Altec Corporation, Anaheim, Calif.
Filed Sep. 17, 1976, Ser. No. 725,089
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—35



249,942
RADIO
Neil William Speakman, G/F, 120 Pokfulam Rd., Hong Kong
Filed Sep. 22, 1976, Ser. No. 725,608
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—79

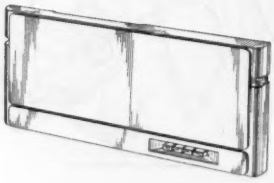


249,943
DEMAND CONTROLLER COMPONENT
Peter G. Bartlett, Davenport, Iowa, assignor to Automation Systems, Inc., Eldridge, Iowa
Filed Mar. 23, 1976, Ser. No. 669,503
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—12

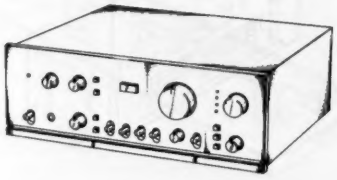


249,944
BATTERY TERMINAL CONNECTOR
Gordon Roy Frank Smith, Newcastle-under-Lyme, England, assignor to Lucas Industries Limited, Birmingham, England
Filed Sep. 22, 1976, Ser. No. 725,916
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24

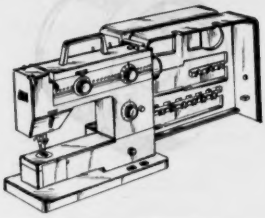
249,945
FRONT PANEL FOR COMPUTER OR SIMILAR ARTICLE
Sven Ingvar Werner Freijd, Linkoping, Sweden, assignor to Saab-Scania Aktiebolag, Linkoping, Sweden
Filed Dec. 27, 1976, Ser. No. 754,695
Claims priority, application Sweden, Jul. 6, 1976, 76-1414
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—40

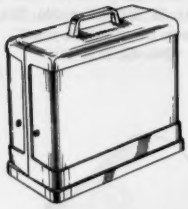


249,946
AMPLIFIER
Kazuhito Ohtomo, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan
Filed Sep. 13, 1976, Ser. No. 722,459
Claims priority, application Japan, Mar. 27, 1976, 51-11075
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—96

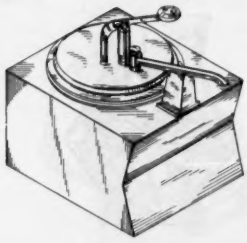


249,947
COMBINED SEWING MACHINE AND CASE THEREFOR
Fritz Gegauf, Steckborn, Switzerland, assignor to Fritz Gegauf Aktiengesellschaft Bernina-Nähmaschinenfabrik, Steckborn, Switzerland
Filed Feb. 2, 1976, Ser. No. 654,105
Term of patent 14 years
Int. Cl. D15—*06;* D3—*02*
U.S. Cl. D15—68

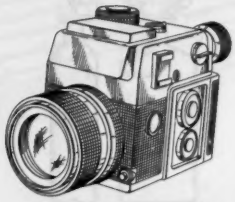




249,948
HOT TOPPING DISPENSER
James W. Brutsman, Cheyenne, Wyo., assignor to Wyott Corporation, Cheyenne, Wyo.
Filed Sep. 20, 1976, Ser. No. 724,903
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—111



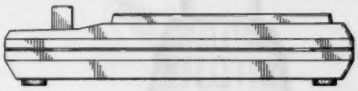
249,949
MIRROR REFLEX CAMERA
Bodo Mielke, Wolfenbüttel; Dieter Mankau, and Friedrich Papke, both of Brunswick, all of Germany, assignors to Rollei-Werke Franke & Heidecke, Brunswick, Germany
Filed Sep. 8, 1976, Ser. No. 721,331
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1976, MR1101
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—01

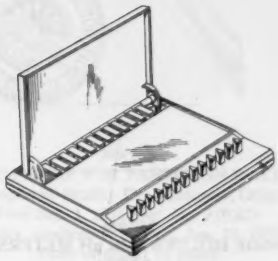


249,950
COMBINED TEMPLATE AND FRAME
Age Stein, 6609 - 224th Southwest, Mountlake Ter., Wash. 98043
Filed Jan. 3, 1977, Ser. No. 755,999
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D19—39

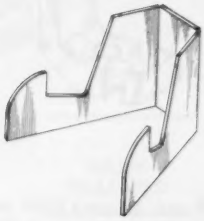
249,951
COMBINED TEMPLATE AND FRAME
Age Stein, 6609 224th Southwest, Mountlake Terrace, Wash. 98043
Filed Jan. 3, 1977, Ser. No. 755,958
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D19—39

249,952
TELEPHONE INDEX
Se-Kit Yuen, 46 Hoi Yuen Rd., 4th Floor, Kwun Tong, Kowloon, Hong Kong
Filed Jul. 19, 1976, Ser. No. 706,520
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—76

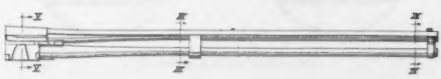




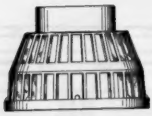
249,953
COMBINED BOOKHOLDER AND BOOKMARK
James Drake, 212 S. Brighton St., Burbank, Calif. 94706
Filed Sep. 27, 1976, Ser. No. 727,017
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—91



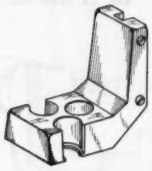
249,954
SHOTGUN BARREL
Donald E. Stark, Olathe, Kans., assignor to Simmons Gun Specialties, Inc., Olathe, Kans.
Filed Apr. 30, 1976, Ser. No. 681,918
Term of patent 3½ years
Int. Cl. D22—*01*
U.S. Cl. D22—7



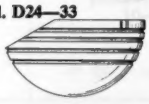
249,955
PUMP STRAINER
John E. Vogelsang, Milwaukee, Wis., assignor to Steel Products Manufacturing Co. Inc., Milwaukee, Wis.
Filed Jul. 1, 1976, Ser. No. 701,552
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—42

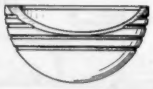


249,956
ELECTRODE HOLDER FOR pH METERS AND THE LIKE
Robert S. Potts, Sherborn, Mass., assignor to Corning Glass Works
Filed Feb. 7, 1977, Ser. No. 765,924
Term of patent 14 years
Int. Cl. D24—*01, 99*
U.S. Cl. D24—29



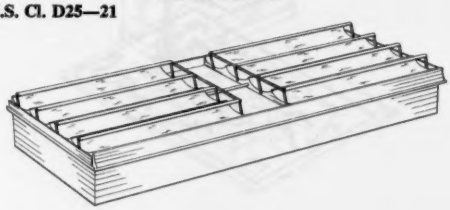
249,957
HIP CUP PROSTHESIS
Palmer O. Eicher, Indianapolis, and Dennert O. Ware, Warsaw, both of Ind., assignors to Bio-Dynamics Inc., Indianapolis, Ind.
Filed Oct. 4, 1976, Ser. No. 729,471
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—33



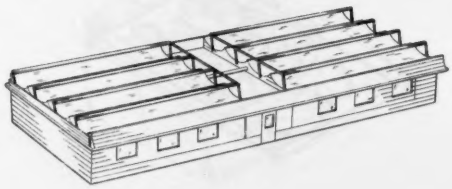


249,958
DISPENSING CONTAINER FOR PHARMACEUTICAL DILUENTS
Eugene J. Meierhoefer, Hackettstown, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Jan. 10, 1977, Ser. No. 758,266
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—56

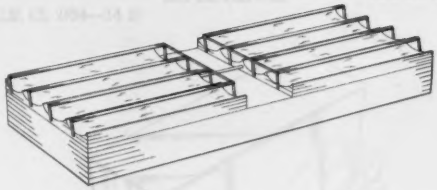
249,959
BUILDING
Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Filed Feb. 8, 1977, Ser. No. 766,842
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—21



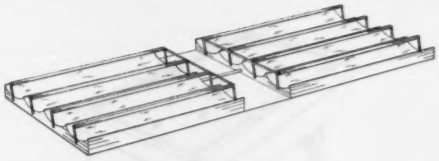
249,960
BUILDING
Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Filed Feb. 8, 1977, Ser. No. 766,843
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—21



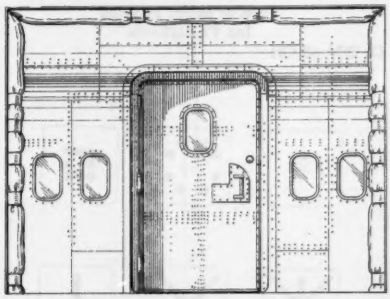
249,961
BUILDING
Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Filed Feb. 8, 1977, Ser. No. 766,845
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—21



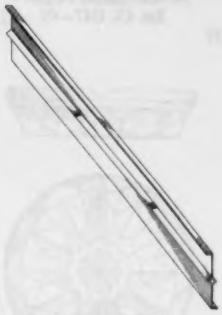
249,962
REFLECTOR CONCENTRATOR USEFUL FOR SOLAR ENERGY
Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Filed Feb. 8, 1977, Ser. No. 766,844
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—56



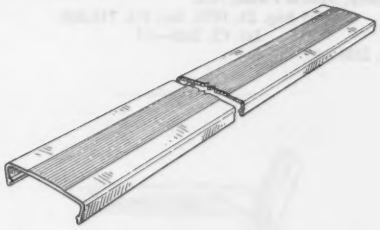
249,963
BUILDING PORTAL
James A. Cosentino, Cheektowaga, N.Y., assignor to The Executive, A Motor Hotel of Buffalo, Inc., Buffalo, N.Y.
Filed Dec. 5, 1975, Ser. No. 637,943
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—59



249,964
ADJUSTABLY LOUVERED ROOF PLATE
Nobujiro Isono, Sano, Japan, assignor to Shin Nippon Kinzoku Co., Ltd.
Filed Dec. 6, 1976, Ser. No. 748,043
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

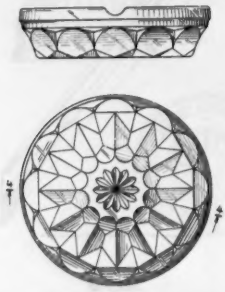


249,965
TRIM STRIP FOR PARTITION WALL
Richard A. Cooper, 58 Bridley Dr., Agincourt, Ontario, Canada
Filed Sep. 1, 1976, Ser. No. 719,563
Claims priority, application Canada, Jun. 29, 1976, 290676
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—76

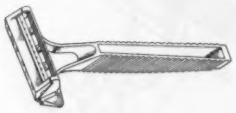


249,966
WALL TILE
Georges Marquis, 12010 Langelier, App. 302, Montreal-Nord, Quebec, Canada
Filed Mar. 15, 1976, Ser. No. 666,978
Claims priority, application Canada, Jan. 9, 1976, 090176
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—92

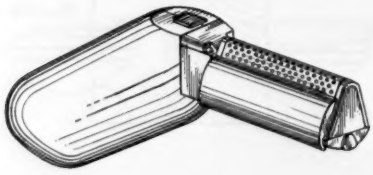
249,967
ASHTRAY OR SIMILAR ARTICLE
Frank J. Benes, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Division of Ser. No. 545,621, Jan. 30, 1975, which is a division of Ser. No. 397,062, Sep. 13, 1973, abandoned. This application Sep. 2, 1976, Ser. No. 719,719
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D27—27



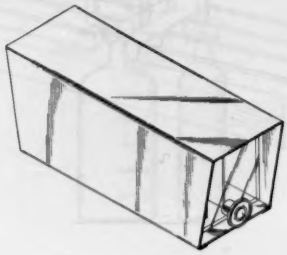
249,968
RAZOR
Ernest F. Kiraly, Fairfield, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Aug. 23, 1976, Ser. No. 716,608
Int. Cl. D28—*03*
U.S. Cl. D28—46



249,969
SHAVER
Knut Benny Weideskog, Fredsgatan 2, S-222 20 Lund, Sweden
Filed May 14, 1976, Ser. No. 686,535
Claims priority, application Sweden, Nov. 25, 1975, 752339
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—49

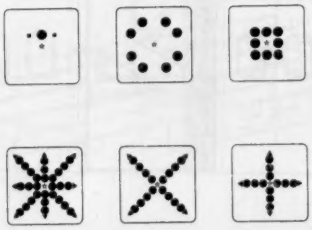


249,970
RECEPTACLE FOR HOLDING DOCUMENTS OR THE LIKE
Donald C. J. Wetzel, 12830 Hillcrest, Suite 111, Dallas, Tex. 75230
Filed Feb. 7, 1977, Ser. No. 766,203
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D99—28

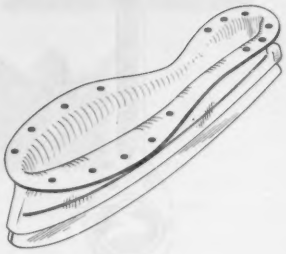


249,971
GAME TABLE
James A. Fields, Jr., 3245 Corey Dr., Jackson, Miss. 39212
Filed Sep. 2, 1976, Ser. No. 719,712
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—3

249,972
CHESS PIECE SET
Granville P. Murphy, P.O. Box 27724, Los Angeles, Calif. 90027
Filed Oct. 1, 1976, Ser. No. 728,889
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 CH



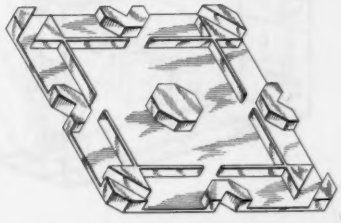
249,973
ICE SKATE
Ian F. Norton, Toronto, and Gerald Beekenkamp, Etobicoke, both of Canada, assignors to Greb Industries Limited, Kitchener, Canada
Filed Jul. 6, 1976, Ser. No. 702,407
Claims priority, application Canada, May 31, 1976, 3105762
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—14 B



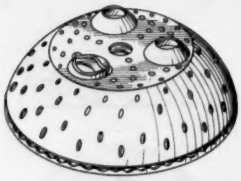
249,974
SKI
Anton Arnsteiner, Mittersill, Austria, assignor to Blizzard Gesellschaft m.b.H., Mittersill, Austria
Filed Jan. 10, 1977, Ser. No. 758,173
Claims priority, application Austria, Jul. 12, 1976, 12215
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—14 D

249,975
SKI
Anton Arnsteiner, Mittersill, Austria, assignor to Blizzard Gesellschaft m.b.H., Mittersill, Austria
Filed Jan. 10, 1977, Ser. No. 758,174
Claims priority, application Austria, Jul. 12, 1976, 12262
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—14 D

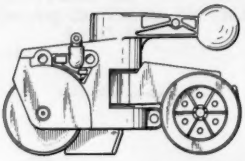
249,976
CONSTRUCTION PIECE
Ronald Gronert, Willem de Rijkelaan 76, Hillegom, Netherlands
Filed Dec. 2, 1975, Ser. No. 637,099
Claims priority, application Benelux, Jun. 2, 1975, 50336
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 GG



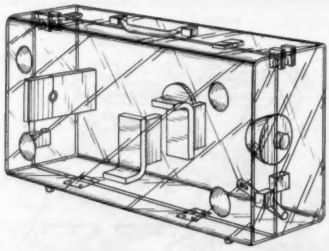
249,977
WATER TOY
Holger F. Kilander, Hackensack, Minn., assignor to Gabriel Industries, Inc., New York, N.Y.
Filed May 12, 1976, Ser. No. 685,863
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 R



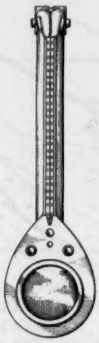
249,978
TOY ROLLER-GRADER
Jeffrey T. Samson, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Oct. 29, 1976, Ser. No. 737,177
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34 –15 AJ



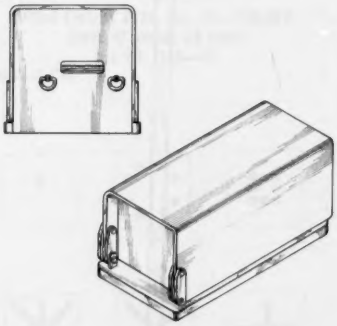
249,979
MUSIC INSTRUMENT CASE
Carlos Fernandez, 943 W. 34th St., Chicago, Ill.
Filed Dec. 30, 1975, Ser. No. 645,317
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D56—1 B



249,980
STRINGED MUSICAL INSTRUMENT
Frank Eventoff, 2351 Lakeview Ave., Los Angeles, Calif. 90039
Filed Jan. 27, 1976, Ser. No. 652,834
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A

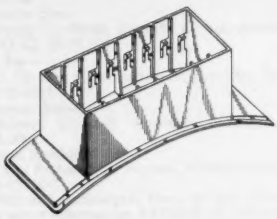


249,981
LABEL PRINTER
Edward C. Karp, Belvidere, Ill., assignor to Sanitary Scale Company
Filed Jan. 21, 1977, Ser. No. 761,356
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D64—10

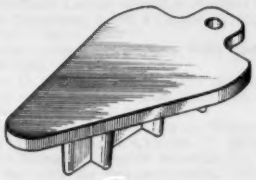


249,982
COVER FOR A TISSUE DISPENSER
Kitty K. Kubusheski, 5041 NE. 14th Ave., Pompano Beach, Fla. 33064
Filed Apr. 21, 1976, Ser. No. 678,766
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D87—1 R

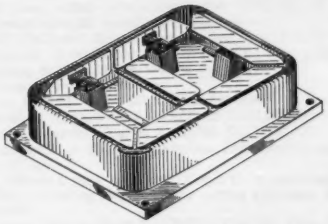
249,983
TAPE CARTRIDGE CADDY FOR A CAR
Gerald J. Niles, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company
Filed Jan. 17, 1977, Ser. No. 760,119
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—1 D



249,984
COMBINED KEY CHAIN FOB AND TAB CAN OPENER
Lynn V. Parker, 409 Browning Dr., Arlington, Tex. 76010
Filed Jan. 31, 1977, Ser. No. 764,047
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—8.3



249,985
VARIABLE CHARACTER DISPLAY
Alfred Skrobisch, Huntington Station, N.Y., assignor to The Staver Company, Incorporated, Bay Shore, N.Y.
Filed Oct. 12, 1976, Ser. No. 731,849
Term of patent 14 years
Int. Cl. D20—*03;* D14—*02*
U.S. Cl. D96—12 K



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF OCTOBER, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Chance Company: *See*—
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A. B. Dick Company: *See*—
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Eastman, James E.; and del Valle, Frank, 4,120,982, Cl. 426-405.000.
Moore, Carl Orville, 4,120,987, Cl. 426-572.000.

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A. Monforts: *See*—
Van der Horst, Eberhard, 4,120,219, Cl. 82-2.00R.

A/S Weston Taeppefabrik: *See*—
Jensen, Finn Ulrik Hansen; Nielsen, Per Drengsgaard; and Bruhn, Esben, 4,120,713, Cl. 156-72.000.

A. Vuyk & Zonen's Scheepswerven B.V.: *See*—
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A. Ward Ford Memorial Institute, Inc.: *See*—
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AB Akerlund & Rausing: *See*—
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AB ID-kort: *See*—
Abramson, Nils; and Bjelkhagen, Hans, 4,120,559, Cl. 350-3.600.

AB Turn-O-Matic: *See*—
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Abe, Minoru, to Eiwa Confectionary Co. Apparatus for making ball-shaped marshmallow products. 4,120,627, Cl. 425-92.000.

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Abrams, William Randolph: *See*—
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Accumulatorenfabrik Sonnenschein GmbH: *See*—
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Adamovske strojirny, narodni podnik: *See*—
Cerny, Arnost, 4,120,492, Cl. 271-277.000.

Addison, George Thomas, to Coal Industry (Patents) Limited. Apparatus for controlling the steering mechanism of a mining machine. 4,120,534, Cl. 299-1.000.

Adelski, Hans-Joachim; and Gertz, Wilhelm, to Siemens Aktiengesellschaft. External-rotor type drum motor. 4,121,127, Cl. 310-67.00R.

Adler, Stanford L.; and Gordon, Abraham, to Technicon Instruments Corporation. Apparatus for transferring a plurality of smears. 4,120,262, Cl. 118-642.000.

Adomeit, Heinz Dieter. Safety belt clamping device. 4,120,466, Cl. 242-107.200.

Adwest Engineering Limited: *See*—
Millard, Barry John, 4,120,597, Cl. 403-24.000.

Aeschliman, Anthony. Duck decoy. 4,120,110, Cl. 43-3.000.

Agarwal, Suresh C.; and Koci, Zdenek, to Ciba-Geigy Corporation. Dye preparation. 4,120,648, Cl. 8-85.00R.

Agfa-Gevaert Aktiengesellschaft: *See*—
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Ahlstone, Arthur G., to Vetco, Inc. Lockable rigid connector for pipe and method of making the same. 4,120,520, Cl. 285-18.000.

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Aimi, Mitsuo, to Matsushita Electric Industrial Co., Limited. Power transmission flat cable for remote-controlled electrical apparatus. 4,121,063, Cl. 200-18.000.

Airheart, Franklin B., to Airheart Products, Inc. Multiple piece braking disc assembly. 4,120,386, Cl. 188-218.0XL.

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Akerkar, Anandrao S.; and Rutner, Herman, to Becton, Dickinson & Company. Monoradioiodinated phenolic esters, acids and amines. 4,120,867, Cl. 260-326.400.

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Akushsky, Izrail Yakovlevich; Burtsev, Vladimir Mikhailovich; Duisenov, Bulat Esenovich; Pak, Ivan Timofeevich; and Zhautykov, Anurbek Orymbekovich, to Institut Matematiki i Mekhaniki Akademii Nauk Kazakhskoi SSR. Central processing unit for numbers represented in the system of residual classes. 4,121,298, Cl. 364-746.000.

Alberkrack, Jade Henry; and Hilliker, Stephen Earl, to Motorola, Inc. Digital phase locked loop tuning system. 4,121,162, Cl. 325-421.000.

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Allen, Royce; Sutton, Jerry L.; Griffin, Dan M.; Frye, Hal W.; and Colborn, Joseph G., to United States of America, Navy. Analog sound velocity calculator. 4,121,290, Cl. 364-565.000.

Allen, Royce D.; and Easter, Rollen G., to Caterpillar Tractor Co. Saddle/main frame fabrication. 4,120,511, Cl. 280-795.000.

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Althuis, Thomas H.; Czuba, Leonard J.; Hess, Hans-Jurgen E.; and Kadin, Saul B., to Pfizer Inc. Fused pyrimidin-4(3H)-ones as antiallergy agents. 4,120,962, Cl. 424-251.000.

Altman, Richard M.; and McLaughlin, Thomas D., to Vivitar Corporation. Focusing and projection screen. 4,121,234, Cl. 354-201.000.

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Amendola, Steven. Waste gas pollution control systems. 4,120,669, Cl. 55-73.000.

Amerace Corporation: *See—*
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America Cyanamid Company: *See—*
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Joseph, Joseph Peter; and Bernstein, Seymour, 4,120,954, Cl. 424-180.000.
Nair, Vijay Gopalan; and Bernstein, Seymour, 4,120,953, Cl. 424-180.000.
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Anderson, Donald J., to Chevron Research Company. Method and apparatus for recovering viscous petroleum from thick tar sand. 4,120,357, Cl. 166-272.000.

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Ando, Masahisa; Katow, Keigo; and Yamazaki, Masami, to Toyota Jidosha Kogyo Kabushiki Kaisha. Valve device for an exhaust gas recirculation system of an internal combustion engine. 4,120,480, Cl. 251-61.500.

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ap Rhys, Tomos L., to United States of America, Navy. Two-axis motion compensation for AMTI. 4,121,209, Cl. 343-7.700.

Appel, Adolf; and Reymann, Wolfgang, to Gildemeister Corpoplast GmbH. Apparatus for blow-molding hollow articles, in particular bottles. 4,120,636, Cl. 425-541.000.

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Auer, John H., Jr., to General Signal Corporation. Highway crossing system with improved ring sustain feature. 4,120,471, Cl. 246-128.000.

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Azam, Guy; Bensussan, Andre; and Levaillant, Claude, to CGR-MeV. Arrangement for automatically controlling the frequency of a hyperfrequency generator feeding a resonant element subjected to fluctuations in temperature. 4,121,173, Cl. 331-9.000.

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Bacher, Helmuth, to Krauss-Maffei Austria Gesellschaft m.b.H. Disintegrating appliance. 4,120,460, Cl. 241-278.00R.

Bachmann, Klaus Jurgen; Schmidt, Paul Herman; Spencer, Edward Guerrant; and Harsha, Karnamadakala Sreenivasaacharlu Sree, to Bell Telephone Laboratories, Incorporated. Metal oxide/indium phosphide devices. 4,121,238, Cl. 357-16.000.

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Baghdadi, Aslan; and Ellis, Ralph J., to Motorola, Inc. Crossed grain growth. 4,120,743, Cl. 156-620.000.

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Baker, George Edward, to Amchem Company Limited. Apparatus for and method of refeeding electrodes in an electrical discharge machining apparatus. 4,121,081, Cl. 219-69.00E.

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Banga, Julius, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Direct current converter. 4,121,281, Cl. 363-17.000.

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Bapatla, Krishna M.; and Brychta, Katharyn M., to Cooper Laboratories, Inc. Ophthalmic solution. 4,120,949, Cl. 424-80.000.

Barbano, Normand, to United States of America, Army. Corner reflector antenna for DF and tracking applications. 4,121,215, Cl. 343-18.00C.

Barendsz, Anton Willem; De Borst, Cornelis; Post, Alfred Johannes Antonius; and Schimmel, Joannes, to Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek ten behoeve van de Rijksverdediging. Detection of alkylating compounds. 4,120,754, Cl. 195-99.000.

Barrett, Walter H., to Columbia Chase Corporation. Solar collector. 4,120,288, Cl. 126-271.000.

Barth, Wayne E., to Pfizer Inc. 4-(Tetrazol-5-yl)-Δ^3-cephem compounds. 4,121,040, Cl. 544-28.000.

Barton, Sterling C.: *See*—
Armor, Anthony F.; Barton, Sterling C.; Chari, Madabushi V.; Collings, Harold E.; and Turnbull, George W., 4,121,126, Cl. 310-59.000.

Bartsch, Wolfgang: *See*—
Kampe, Wolfgang; Senn, Martin; Thiel, Max; Bartsch, Wolfgang; and Dietmann, Karl, 4,120,963, Cl. 424-256.000.

BASF Aktiengesellschaft: *See*—
Gettert, Hans; Fromm, Hermann Dieter; Molzahn, Martin; Schier, Ernst-Juergen; and Schneehage, Hans Henning, 4,120,667, Cl. 55-48.000.
Jaedicke, Hagen; and Paust, Joachim, 4,120,868, Cl. 260-340.700.
Kovacs, Jenoe; Jung, Hans; Marx, Matthias; and Spoor, Herbert, 4,121,266, Cl. 528-288.000.
Martin, Wolfgang; Bauer, Wolfgang; Herion, Dieter; Linge, Hermann; and Knopp, Hans, 4,120,078, Cl. 28-252.000.
Mueller-Tamm, Heinz; Schick, Hans; Jaggard, James F. R.; and Nickl, Johann, 4,120,823, Cl. 252-442.000.
Pohlemann, Heinz; Naarmann, Herbert; and Seebach, Dieter, 4,121,027, Cl. 526-29.000.
Woerner, Frank Peter; Kan, Peter T.; and Falkenstein, Georg, 4,120,884, Cl. 260-453.0SP.

BASF Wyandotte Corporation: *See*—
Ciko, John D.; Cramer, John J.; and Jamieson, Geoffrey A., 4,120,799, Cl. 252-8.600.
Ciko, John D.; Cramer, John J.; and Jamieson, Geoffrey A., 4,120,802, Cl. 252-8.750.
Kappler, Frank Robert; Killian, Roma Jean; and Cramer, John Joseph, 4,120,650, Cl. 8-109.000.

Baskall, William C. Traction device for power driven vehicles. 4,120,336, Cl. 152-216.000.

Bastenhof, Dirk, to Societe d'Etudes de Machines Thermiques-S.E.M.T. Device for injecting water into the cylinders of an internal combustion engine, particularly for reducing the degree of pollution of the latter. 4,120,268, Cl. 123-25.00C.

Battelle Memorial Institute: *See*—
Breda, Frederic; and Jonville, Pierre, 4,120,763, Cl. 204-73.00R.
Trojer, Felix; O'Connor, Grahame Paul; and Tannenberger, Helmut, 4,120,730, Cl. 106-39.600.

Bauer, Wilfried; and Pless, Janos, to Sandoz Ltd. Organic compounds. 4,120,852, Cl. 260-112.50S.

Bauer, Wolfgang: *See*—
Martin, Wolfgang; Bauer, Wolfgang; Herion, Dieter; Linge, Hermann; and Knopp, Hans, 4,120,078, Cl. 28-252.000.

Baues, Peter; and Winzer, Gerhard, to Siemens Aktiengesellschaft. Optical waveguide network. 4,120,560, Cl. 350-96.140.

Baummer, George P. Apparatus and process for ordinary and submarine mineral beneficiation. 4,120,783, Cl. 209-18.000.

Baur, Leslie L.; and Hajduk, Thaddeus J., to Zenith Radio Corporation. Space-conservative apparatus with mechanical memory for holding and cataloging shadow masks. 4,120,407, Cl. 214-6.0BA.

Baxter Travenol Laboratories, Inc.: *See*—
Brown, Richard I.; and Boggs, Daniel R., 4,120,449, Cl. 233-23.00R.
Cullis, Herbert M., 4,120,448, Cl. 233-22.000.
Lessner, David L., 4,120,586, Cl. 356-100.000.
Range, Richard J.; and Soodak, Charles I., 4,120,202, Cl. 73-421.00R.

Bayer Aktiengesellschaft: *See*—
Baatz, Gunther; Dahm, Manfred; and Triebeneck, Kurt, 4,120,518, Cl. 282-27.500.
Kloker, Werner; Bovender, Franz; Gromping, Franz; Goerden, Leonhard; and Niesel, Harald, 4,120,923, Cl. 264-45.300.
Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Hammann, Ingeborg; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,120,956, Cl. 424-200.000.
Paulus, Wilfried; and Genth, Hermann, 4,120,686, Cl. 71-67.000.
Winkler, Adolf, 4,120,866, Cl. 260-315.000.

BBC Brown, Boveri & Company Limited: *See*—
Bachmann, Robert, 4,121,107, Cl. 250-455.000.
Berndes, Gunter; and Meyer, Eckhard, 4,121,239, Cl. 357-39.000.

Bearden, Roby, Jr.: *See*—
Baird, William Chalmers, Jr.; Bearden, Roby, Jr.; and Bollinger, Ralph Louis, Jr., 4,120,779, Cl. 208-108.000.

Beasom, James D., to Harris Corporation. Process of fabricating junction isolated IGFET and bipolar transistor integrated circuit by diffusion. 4,120,707, Cl. 148-186.000.

Bebrueder Ahle: *See*—
Borlinghaus, Arthur, 4,120,489, Cl. 267-61.00R.

Beck, Otto; and Hamm, Klaus, to Robert Bosch GmbH. Apparatus for transversely sealing a wrapping tube. 4,120,235, Cl. 93-33.00H.

Beck, Robert E.: *See*—
Gardner, Jeffrey M.; and Beck, Robert E., 4,120,443, Cl. 229-42.000.

Becker, Dale F.; Samuel, Trevor N.; and Sangamo Electric Company. Electric meter for mounting with a standard watthour meter. 4,121,147, Cl. 324-104.000.

Becker, Friedbert; Grafinger, Wilhelm; and Hildebrandt, Bernhard, to Siemens Aktiengesellschaft. Device for increasing the safety with respect to transmission faults in an information transmission system. 4,121,208, Cl. 343-6.50R.

Becker, Herbert, to Metallwerk Max Brose GmbH & Co. Lifting arrangement for a window of a vehicle and the like. 4,120,120, Cl. 49-351.000.

Beckman Instruments, Inc.: *See*—
Nielsen, Steven Thomas, 4,120,927, Cl. 264-98.000.
Pierre, Kenneth J.; and Tung, Ker-Kong, 4,120,755, Cl. 195-103.50C.

Becton, Dickinson & Company: *See*—
Akerkar, Anandrao S.; and Rutner, Herman, 4,120,867, Cl. 260-326.400.
Gutcho, Sidney; and McCarter, Henry, 4,120,945, Cl. 424-1.000.

Bednarski, John R.; and Russell, David B., to M&T Chemicals Inc. Biologically active triorganotin copolymers. 4,121,034, Cl. 526-240.000.

Behnke, Wallace Peery; Chapin, Robert Stuart; and Fierro, John Francis, to Du Pont de Nemours, E. I., and Company. Aromatic polyamide fiber blend for protective clothing. 4,120,914, Cl. 260-857.0TW.

Behrenz, Wolfgang: *See*—
Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Hammann, Ingeborg; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,120,956, Cl. 424-200.000.

Bel, Jean-Pierre L.: *See*—
Rabischong, Pierre; and Bel, Jean-Pierre L., 4,120,297, Cl. 128-78.000.

Belcher, Charles Brian: *See*—
Hodges, Raymond John; and Belcher, Charles Brian, 4,120,584, Cl. 356-36.000.

Belco Pollution Control Corporation: *See*—
Lanese, Philip M., 4,120,672, Cl. 55-112.000.

Bell & Howell Company: *See*—
Flint, John R.; Erikson, Rolf B.; and Rabindran, George, 4,121,138, Cl. 318-7.000.

Johnston, Robert F.; and Wells, Thomas R., 4,120,573, Cl. 353-27.00A.
Bell Industries: *See—*
Kaye, Peter D., 4,120,215, Cl. 76-25.00A.
Bell Telephone Laboratories, Incorporated: *See—*
Bachmann, Klaus Jurgen; Schmidt, Paul Herman; Spencer, Edward Guerrant; and Harsha, Karnamadakala Sreenivasaacharlu Sree, 4,121,238, Cl. 357-16.000.
Gibbs, Hyatt McDonald; McCall, Samuel Leverte, Jr.; and Venkatesan, Thirumalai Nallan Chakravarthy, 4,121,167, Cl. 330-4.300.
Beloit Corporation: *See—*
Alheid, Robert J., 4,120,349, Cl. 165-89.000.
Bendix Corporation, The: *See—*
Bridges, Robert M., 4,120,519, Cl. 285-3.000.
Carp, Ralph W.; Ang, Leoncio T.; Leadbetter, Laurence D.; and Cornell, Grant Arthur, 4,120,539, Cl. 503-103.000.
Waldron, Clifford R.; Yonkers, Karl W.; and Uhlig, Herbert K., 4,120,556, Cl. 339-142.000.
Benjamin, Milton L., to Erickson Tool Company. Spade drill. 4,120,601, Cl. 408-226.000.
Benkoe, Erwin: *See—*
Goldfarb, Adolph E.; and Benkoe, Erwin, 4,120,497, Cl. 273-95.00B.
Bennett, James Vine: *See—*
Pamplin, John Warner; Bennett, James Vine; and Elson, Peter Fred, 4,120,186, Cl. 72-278.000.
Benoit, Michel, to Delattre-Levivier. Method of regulating the process of agglomeration of a mineral on an endless chain. 4,120,643, Cl. 432-36.000.
Bensussan, Andre: *See—*
Azam, Guy; Bensussan, Andre; and Levaillant, Claude, 4,121,173, Cl. 331-9.000.
Berendt, Hans-Ulrich: *See—*
Lauton, Alain; and Berendt, Hans-Ulrich, 4,120,647, Cl. 8-17.000.
Berg, Keith E.: *See—*
Tinker, Donald; and Berg, Keith E., 4,120,790, Cl. 210-65.000.
Berg, Marvin I.: *See—*
Pasic, James '..; and Berg, Marvin I., 4,120,239, Cl. 100-26.000.
Bernardi, Dario. Wheel equipped with brake, particularly for motorcycles. 4,120,536, Cl. 301-6.00E.
Berndes, Gunter; and Meyer, Eckhard, to BBC Brown, Boveri & Company Limited. Controllable semiconductor component for two current directions. 4,121,239, Cl. 357-39.000.
Bernhardt, Wolfgang: *See—*
Heiser, Joachim; Bernhardt, Wolfgang; and Schempp, Roland, 4,120,233, Cl. 91-511.000.
Bernstein, Seymour: *See—*
Conrow, Ransom Brown; and Bernstein, Seymour, 4,120,894, Cl. 260-507.00R.
Conrow, Ransom Brown; Poletto, John Frank; and Bernstein, Seymour, 4,120,895, Cl. 562-457.000.
Conrow, Ransom Brown; and Bernstein, Seymour, 4,120,896, Cl. 562-430.000.
Joseph, Joseph Peter; and Bernstein, Seymour, 4,120,954, Cl. 424-180.000.
Nair, Vijay Gopalan; and Bernstein, Seymour, 4,120,953, Cl. 424-180.000.
Poletto, John Frank; and Bernstein, Seymour, 4,120,891, Cl. 260-506.000.
Poletto, John Frank; Conrow, Ransom Brown; and Bernstein, Seymour, 4,120,892, Cl. 260-506.000.
Poletto, John Frank; Conrow, Ransom Brown; and Bernstein, Seymour, 4,120,893, Cl. 260-506.000.
Berrie, John Sorbie; and Woolley, Graham Edward, to Imperial Chemical Industries Limited. Manufacture of calcium sulphate alpha hemihydrate. 4,120,737, Cl. 106-109.000.
Bertelmann, Gunter: *See—*
Schwarzmann, Gunter; Holtschmidt, Ulrich; and Bertelmann, Gunter, 4,120,979, Cl. 424-325.000.
Berthold, Richard: *See—*
Bormann, Gerhard; and Berthold, Richard, 4,120,965, Cl. 424-258.000.
Bethlehem Steel Corporation: *See—*
Galanis, Tom L.; Hoffner, Joel L.; Clymer, John C.; Hostetter, Richard S., Jr.; Jones, Duane T.; and Yerkes, Ronald W., 4,121,292, Cl. 364-571.000.
Galanis, Tom L.; Hoffner, Joel L.; Clymer, John C.; and Jones, Duane T., 4,121,294, Cl. 364-571.000.
Hoffner, Joel L.; and Galanis, Tom L., 4,121,291, Cl. 364-571.000.
Webster, Geoffrey R., 4,120,921, Cl. 264-23.000.
Bethurum, George M., to Champagne Machine Inc., The. Apparatus for dispensing sparkling wines. 4,120,425, Cl. 222-146.00C.
Bettis Corporation: *See—*
Thompson, Richard L.; Hubbert, Murray J.; and Wade, Vernon J., 4,120,479, Cl. 251-56.000.
Bezold, Helmut, to Kraftwerk Union Aktiengesellschaft. Fuel element skeleton. 4,120,751, Cl. 176-78.000.
Bezstarosti, Ladislav; Lzicar, Josef; Lanta, Jiri; and Kriz, Vladimir, to Vyzkumny ustav bavlnarsky. Shed forming device for looms. 4,120,326, Cl. 139-55.100.
Bhateja, Chander Prakash; Alling, Richard Lassen; and Johnston, Dean Edward, to Torrington Company, The. Cageless thrust bearing with unguided rollers. 4,120,542, Cl. 308-219.000.
Bianchi, Edward Armond; and Forney, Edger Wilmot, Jr., to AMP Incorporated. Coaxial cable connector. 4,120,554, Cl. 339-97.00R.
Bice, John R.; and Lewis, Philip J., to Brogdex Company. Composition for preventing decay of fruit and inhibiting sporulation thereon. 4,120,970, Cl. 424-270.000.
Bicosa Societe de Recherches: *See—*
de Mere, Henri Courier, 4,121,115, Cl. 307-150.000.
Bieringer, Robert J.; and Ringlien, James A., to Owens-Illinois, Inc. Method for measuring the thickness of transparent articles. 4,120,590, Cl. 356-161.000.
Bileski, Thomas; Crawford, Joe W.; Blanton, Bobby D.; Johnson, Carl N.; Garcia, Felix; Orcutt, John W.; Shepherd, Glen C.; and Oursler, James A., to Texas Instruments Incorporated. Condition responsive electrical switch having improved bridging contact means. 4,121,073, Cl. 200-83.00P.
Bilibina, Galina Vladimirovna: *See—*
Kuznetsova, Nadezhda Nikolaevna; Samsonov, Georgy Vasilievich; Papukova, Klavdia Pavlovna; Bilibina, Galina Vladimirovna; Shataeva, Larisa Konstantinovna; Selezneva, Aida Alexandrovna; Kuznetsova, Nina Petrovna; Vitols, Oyar Ansovich; Shtrausa, Anite Ansovna; Gudkin, Lev Romanovich; Mishaeva, Rimma Nikodimovna; and Rozhetskaya, Karina Moiseevna, 4,120,831, Cl. 521-38.000.
Bingham, Elena Maria; and Middleton, William Joseph, to Du Pont de Nemours, E. I., and Company. Process for the preparation of 3-fluorobenzodiazepines. 4,120,856, Cl. 260-239.30D.
Birkelbach, Donald F., to Dow Chemical Company, The. High efficiency catalyst for polymerizing olefins. 4,120,820, Cl. 252-429.00B.
Birnbaum, George: *See—*
Malmuth, Norman D.; Birnbaum, George; and Iceland, William F., 4,121,087, Cl. 219-121.00L.
Bishop, Robert Eugene, to International Business Machines Corporation. Apparatus for the reversal of a hot roll in a fusing assembly. 4,121,089, Cl. 219-216.000.
Bittenson, Steven N.; and Houston, Paul L., to Cornell Research Foundation, Inc. Photochemical method for carbon isotopic enrichment. 4,120,767, Cl. 204-158.00R.
Bjelkhagen, Hans: *See—*
Abramson, Nils; and Bjelkhagen, Hans, 4,120,559, Cl. 350-3.600.
Blackband, Trevor William, to Sterling-Winthrop Group Limited. Reciprocating pumps for dispensing pastes, liquids and other substances. 4,120,619, Cl. 417-511.000.
Blair, Thomas O. Tubular loop forming tool for sewing machines. 4,120,253, Cl. 112-151.000.
Blakeslee, Edward A.: *See—*
Schoeneberger, Ernest A.; and Blakeslee, Edward A., 4,120,137, Cl. 56-226.000.
Blanton, Bobby D.: *See—*
Bileski, Thomas; Crawford, Joe W.; Blanton, Bobby D.; Johnson, Carl N.; Garcia, Felix; Orcutt, John W.; Shepherd, Glen C.; and Oursler, James A., 4,121,073, Cl. 200-83.00P.
Blench, Michael: *See—*
Venton, Peter Charles; Blench, Michael; Sutherland, Anthony Keith; and Hodges, Kenneth James Hamer, 4,121,286, Cl. 364-200.000.
Blink, Robert O.; and Lutzke, William C., to Mitchell Manufacturing Company. Folding table equipped with improved latch mechanism that holds table top sections coplanar and prevents accidental injury during unfolding. 4,120,249, Cl. 108-113.000.
Bliudnikas, Kestutis E., to Alden Research Foundation. Facsimile recording stylus. 4,121,225, Cl. 346-139.00C.
Blomberg, James K., to Popper's Choice Company, The. Corn popper. 4,120,236, Cl. 99-323.900.
Blossey, Daniel F., to Xerox Corporation. Synchronous helical scan-helical record magnetic imaging. 4,121,261, Cl. 358-301.000.
Blount, David H. Process for the production of halosilicon acids and organic silicon acid compounds and resinous products. 4,120,937, Cl. 423-325.000.
Blum, Helmut; and Worms, Karl-Heinz, to Henkel Kommanditgesellschaft auf Aktien. Diphosphonoalkane carboxylic acids, process of preparation and methods of use. 4,120,890, Cl. 260-502.40P.
Blumbergs, John H.: *See—*
Erickson, Clifford A.; Finley, Joseph H.; Blumbergs, John H.; and Scholer, Fred R., 4,120,651, Cl. 8-111.000.
Scholer, Fred R.; and Blumbergs, John H., 4,120,652, Cl. 8-111.000.
Blunier, Dennis L.: *See—*
Roley, Robert D.; Haslett, Glenn M.; and Blunier, Dennis L., 4,120,537, Cl. 305-14.000.
BMR Security Products Corp.: *See—*
Walters, Russell W., 4,120,183, Cl. 70-159.000.
Bober, Peter: *See—*
Krause, Walter; Bober, Peter; and Haas, Eckhard, 4,120,273, Cl. 123-122.00G.
BOC Limited: *See—*
English, James, 4,121,097, Cl. 250-202.000.
Bockno, Gregory C., to Avtex Fibers Inc. Crimped, high-strength rayon yarn and method for its preparation. 4,121,012, Cl. 428-369.000.
Bodenseewerk Perkin-Elmer & Co., GmbH: *See—*
Braun, Klaus Joachim, 4,120,200, Cl. 73-355.00R.
Bodor, Nicolae S., to Interx Research Corporation. Labile quaternary ammonium salts useful in binding bile acids in warm-blooded animals. 4,120,959, Cl. 424-238.000.
Boehringer Mannheim GmbH: *See—*
Kampe, Wolfgang; Senn, Martin; Thiel, Max; Bartsch, Wolfgang; and Dietmann, Karl, 4,120,963, Cl. 424-256.000.
Boeing Company, The: *See—*
Devlieg, Garrett Howard, 4,120,540, Cl. 303-117.000.
Downey, Thomas James; Turnbull, Peter Dennis; and Gayther, James Walter, 4,121,194, Cl. 340-27.00R.

Fadden, Delmar McLean; Habbestad, Alvin Richard; and Veitengruber, James Edwin, 4,121,246, Cl. 358-103.000.
Sindt, Melvin R., 4,120,712, Cl. 156-71.000.
Wagner, David Lee, 4,120,367, Cl. 173-137.000.
Whitener, Philip Charles, 4,120,470, Cl. 244-213.000.

Bogachenko, Alexei Georgievich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Stupak, Leonid Mikhailovich; Baglai, Viktor Mikhailovich; Bogachenko, Alexei Georgievich; Kazakov, Sergei Sergeevich; and Tsykulenko, Anatoly Konstantinovich, 4,120,695, Cl. 75-10.00C.

Boggs, Daniel R.: *See—*
Brown, Richard I.; and Boggs, Daniel R., 4,120,449, Cl. 233-23.00R.

Bohnhoff, Alan Earl, to Lanier Business Products, Inc. Touch button switch for dictation handset. 4,121,060, Cl. 179-100.1DR.

Bolanos, Jaime A. Guitar with keyboard plucking means. 4,120,227, Cl. 84-320.000.

Boliden Aktiebolag: *See—*
Mioen, Thomas K., 4,120,934, Cl. 423-18.000.

Bollinger, Ralph Louis, Jr.: *See—*
Baird, William Chalmers, Jr.; Bearden, Roby, Jr.; and Bollinger, Ralph Louis, Jr., 4,120,779, Cl. 208-108.000.

Bollman, James E.: *See—*
Mailloux, Louis D.; and Bollman, James E., 4,120,580, Cl. 355-14.000.

Bolth, Franklin Anderson, to Minerec Corporation. Preparation of chlorine-substituted chloroformates. 4,120,888, Cl. 260-463.000.

Bolton, Theodore S.: *See—*
Whitwell, Robert J.; and Bolton, Theodore S., 4,120,170, Cl. 62-91.000.

Bond, William L. Universal drive shaft service kit. 4,120,082, Cl. 29-254.000.

Bondavalli, Francesco: *See—*
Longobardi, Mario; Schenone, Pietro; and Bondavalli, Francesco, 4,120,857, Cl. 260-293.540.

Bonet, Robert Andre, to W. R. Grace & Co. Method of applying printed labels to flexible envelopes using corona discharge treatment. 4,120,716, Cl. 156-272.000.

Bongartz, Paul: *See—*
Haag, Franz; and Bongartz, Paul, 4,120,674, Cl. 55-302.000.

Boos, Charles John; Hausler, Elwood Benjamin; Hirsch, James Arthur; Kasprzyk, Martin Richard; and Smith, Elmer Gene, to Carborundum Company, The. Fuel igniter comprising a novel silicon carbide composition and process for preparing the composition. 4,120,827, Cl. 252-512.000.

Boots Company Limited, The: *See—*
Bristow, Norman W.; Macey, Peter E.; Nichol, Kenneth J.; and Sim, Malcolm F., 4,120,960, Cl. 424-250.000.

Boram, Frank. Hand tools for dispensing particulate matter. 4,120,428, Cl. 222-201.000.

Borden, Inc.: *See—*
Warneke, William Carl, 4,120,940, Cl. 423-490.000.

Borg, Arthur C.; and Zletz, Alex, to Standard Oil Company (Indiana). Method of continuous casting tellurium containing steels. 4,120,344, Cl. 164-73.000.

Borg-Warner Corporation: *See—*
Kimpel, Francis Alfred, 4,120,173, Cl. 62-181.000.
Showalter, Dan Joseph, 4,120,211, Cl. 74-473.00R.

Borgato, Augusto. Device for estimated air navigation, obtained through the combination of various measuring and calculating instruments. 4,120,091, Cl. 33-15.00B.

Borlinghaus, Arthur, to Bebrueder Ahle. Double truncoconical spring of wire with circular cross section. 4,120,489, Cl. 267-61.00R.

Bormann, Gerhard; and Berthold, Richard, to Sandoz Ltd. Octahydro-1,4-diazepino[1,7-b]isoquinolines. 4,120,965, Cl. 424-258.000.

Borner, Alfred. Vegetable and fruit-slicing utensils. 4,120,089, Cl. 30-278.000.

Boschet, Vittorino, to Grafosol S.p.A. Matrix supporting devices in electrostatic development apparatus. 4,120,263, Cl. 118-657.000.

Bosse, Frank, to Windmoller & Holscher. Apparatus for making tapes. 4,120,223, Cl. 83-425.300.

Bosson, Jorgen; and Cragfors, Gunnar, to Asea Aktiebolag. Weighing equipment. 4,120,370, Cl. 177-185.000.

Bottum, Edward W. Refrigerant charged solar water heating structure and system. 4,120,289, Cl. 126-271.000.

Bouder, Paul C., to Etablissements Poutrait-Morin S.A. Hand bicycle pump with pressure preselection and display means. 4,120,614, Cl. 417-63.000.

Bourassa, Joseph R.; and Lopez, Manuel, to Parker-Hannifin Corporation. Vehicle rear view mirror mounting. 4,120,476, Cl. 248-486.000.

Bovender, Franz: *See—*
Kloker, Werner; Bovender, Franz; Gromping, Franz; Goerden, Leonhard; and Niesel, Harald, 4,120,923, Cl. 264-45.300.

Bowen, Leon O., Jr.; and McVean, Michael T., to Rangaire Corporation. Venting and recirculating vent kitchen hood. 4,120,290, Cl. 126-299.00D.

Bowles, Romald E. Hydro-fluidic temperature sensor and control system. 4,120,322, Cl. 137-842.000.

Boyles, Tonnie M.; and Hunter, Hubert E., to Taylor Machine Works, Inc. Air cleaner. 4,120,675, Cl. 55-431.000.

Braddon, George Dayman, Sr., to Mobil Oil Corporation. Packaging support structure. 4,120,398, Cl. 206-408.000.

Braitinger, Helmut: *See—*
Schneider, Franz; Braitinger, Helmut; and Schumann, Burkhard, 4,120,185, Cl. 72-24.000.

Brantl, Victor; and Seeger, Wolfgang. Hand operated device for producing tobacco articles low in noxious substances. 4,120,309, Cl. 131-170.00R.

Braswell, James L.; Covington, Cecil E.; Phillips, Nolan B.; and Snyder, David E., to Textron, Inc. Helicopter blade structure. 4,120,610, Cl. 416-226.000.

Brattesani, Donald N., to Dow Chemical Company, The. Use of copper halide catalysts and certain epoxy compounds to oxidize nitro-substituted Schiff bases to benzoxazoles. 4,120,862, Cl. 260-307.00D.

Braun, Klaus Joachim, to Bodenseewerk Perkin-Elmer & Co., GmbH. Method and device for pyrometric temperature measurements. 4,120,200, Cl. 73-355.00R.

Brecht, William Buttfield. Disk tracking and support apparatus. 4,120,504, Cl. 274-23.00A.

Breda, Frederic; and Jonville, Pierre, to Battelle Memorial Institute. Hydrogen transfer by metal hydride between aqueous medium and organic compound. 4,120,763, Cl. 204-73.00R.

Brehm, Gustav, to Heberlein Maschinenfabrik AG. Device for friction false-twisting of textile yarns of synthetic material. 4,120,144, Cl. 57-77.400.

Breitschaft, Siegfried; and Holtermann, Rolf, to Hoechst Aktiengesellschaft. Process for crystallizing and drying polyethylene terephthalate and apparatus to carry out said process. 4,120,849, Cl. 528-502.000.

Brelen, Hans Erik Osborn: *See—*
Otteblad, Sven Ivar Arne; Brelen, Hans Erik Osborn; Wistrand, Per Folke Magnus; and Samuelson, Svante Ragnar, 4,120,387, Cl. 192-3.00S.

Brematex S.p.A.: *See—*
Micheletti, Fabrizio, 4,120,177, Cl. 66-40.000.
Micheletti, Fabrizio, 4,120,179, Cl. 66-145.00R.

Bremer, Noel J.; White, James F.; and Milberger, Ernest C., to Standard Oil Company. Preparation of maleic anhydride from four-carbon hydrocarbons. 4,120,876, Cl. 260-346.750.

Breuer Electric Manufacturing Company: *See—*
Dwyer, Niles M.; and Rasins, Janis A., 4,120,616, Cl. 417-373.000.

Bridges, Robert M., to Bendix Corporation, The. Collet type cylinder separation device. 4,120,519, Cl. 285-3.000.

Bridgestone Tire Company Limited: *See—*
Soma, Akiro; Kawashima, Haruro; Yamauchi, Makoto; and Tanaka, Shoji, 4,120,337, Cl. 152-353.00R.

Briggs, Peter James: *See—*
Ockwell, Malcolm Charles; McLeod, Patrick Hugh; and Briggs, Peter James, 4,120,715, Cl. 156-252.000.

Brinkman, Willem, to Holec N.V. Pump device for supplying fuel to a combustion engine. 4,120,617, Cl. 417-410.000.

Brissette, William P.: *See—*
Epstein, James; and Brissette, William P., 4,121,020, Cl. 429-162.000.

Bristow, Norman W.; Macey, Peter E.; Nichol, Kenneth J.; and Sim, Malcolm F., to Boots Company Limited, The. Therapeutic agents. 4,120,960, Cl. 424-250.000.

British Steel Corporation: *See—*
Kirkwood, Philip R.; and Clark, Allan, 4,120,440, Cl. 228-231.000.

Broach, Ronald. Illuminated decorative tables. 4,120,248, Cl. 108-23.000.

Broacha, Firoze H.: *See—*
Sivachenko, Eugene W.; Broacha, Firoze H.; and Larkin, Artemas M., 4,120,065, Cl. 14-6.000.

Brockett, Bruce W.: *See—*
Miller, Robert E.; and Brockett, Bruce W., 4,121,013, Cl. 428-411.000.

Brogdex Company: *See—*
Bice, John R.; and Lewis, Philip J., 4,120,970, Cl. 424-270.000.

Brooks, Fred A., Jr., to Exxon Production Research Company. Cement monitoring method. 4,120,166, Cl. 405-225.000.

Brouwer, Walter G.; MacPherson, Edwin J.; Ames, Ronald B.; Neidermyer, Robert W.; and Crittendon, Charles E., to Uniroyal, Inc.; and Uniroyal Ltd. 2-(5-Phenyl-1,3,4-thiadiazol-2-yl)benzoic acid. 4,120,861, Cl. 260-302.00D.

Brown, John S.: *See—*
Hillard, Thomas Gerald, 4,120,510, Cl. 280-87.04A.

Brown, John Steven; and Hillard, Thomas Gerald. Wheeled skateboards. 4,120,508, Cl. 280-11.280.

Brown, Kenard D. Automatic pump for deep wells. 4,120,612, Cl. 417-53.000.

Brown, Ray D.: *See—*
Oloff, Clarence M.; Karl, Alva A.; Wolff, Walter M.; Halbrook, Lloyd W.; Brown, Ray D.; and Dickey, Raymond G., 4,120,266, Cl. 119-103.000.

Brown, Richard I.; and Boggs, Daniel R., to Baxter Travenol Laboratories, Inc. Centrifugal processing apparatus using tube drive. 4,120,449, Cl. 233-23.00R.

Brown & Sharpe Manufacturing Company: *See—*
Headen, William E., 4,120,538, Cl. 308-6.00C.

Brown, Thomas Henry; Durant, Graham John; Ganellin, Charon Robin; and Ife, Robert John, to Smith Kline & French Laboratories Limited. Heterocyclic-methylthioethyl-dithiocarbamates and isothioureas. 4,120,966, Cl. 424-263.000.

Brown, Thomas Henry; Durant, Graham John; Ganellin, Charon Robin; and Ife, Robert John, to Smith Kline & French Laboratories Limited. Imidazolylmethylthio-ethyl isothiourea compounds. 4,120,972, Cl. 424-273.00R.

Bruhn, Esben: *See—*
Jensen, Finn Ulrik Hansen; Nielsen, Per Drengsgaard; and Bruhn, Esben, 4,120,713, Cl. 156-72.000.

Brunet, Maurice: *See—*
Habermann, Helmut; Brunet, Maurice; and Joly, Pierre, 4,121,143, Cl. 318-629.000.

Bruttig, Stephen P. Method and apparatus for determination of dissociation of oxygen from blood. 4,120,658, Cl. 23-230.00B.

Brychta, Katharyn M.: *See—*
Bapatla, Krishna M.; and Brychta, Katharyn M., 4,120,949, Cl. 424-80.000.

Bschorr, Oskar, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Wide-band vibration damper. 4,120,382, Cl. 188-1.00B.

Buchholz, Alexander: *See—*
Stascavage, John A.; Rawls, William W.; and Buchholz, Alexander, 4,120,340, Cl. 160-133.000.

Buck, Elwood W., Jr., to D G Shelter Products Company. Device for opening, closing and latching a vent closure member. 4,120,524, Cl. 292-263.000.

Buckley, Janette A.: *See—*
French, John Barry; Reid, Neil M.; and Buckley, Janette A., 4,121,099, Cl. 250-296.000.

Budker, Gersh Itskovich: *See—*
Auslender, Vadim Leonidovich; Budker, Gersh Itskovich; Glagolev, Georgy Borisovich; Livshits, Anatoly Alexandrovich; Perepelkin, Vitaly Petrovich; Polyakov, Vladimir Arkhipovich; Chepel, Lev Vladimirovich; Chertok, Ilya Lvovich; and Cheskidov, Vladimir Georgievich, 4,121,086, Cl. 219-121.0EM.

Bukkems, Franciscus H. J.: *See—*
Sie, Swan T.; and Bukkems, Franciscus H. J., 4,120,781, Cl. 28-251.00R.

Bukowsky, Michael P. Telephone bracket for holding advertising and writing instrument. 4,120,107, Cl. 40-336.000.

Bunch, Carroll S.; Perry, Jerry L.; and Marcucci, Robert L., to E-Systems, Inc. Direction finder antenna and system. 4,121,216, Cl. 343-113.00R.

Bunker Ramo Corporation: *See—*
Weathers, Paul, 4,121,201, Cl. 340-524.000.

Bunyan, Thomas Walter, to Pilgrim Engineering Developments Limited. Self-straining bolts. 4,120,230, Cl. 85-1.00T.

Burch, Delwin L., to Raymond Lee Organization, Inc., The, a part interest. Gun rack for a vehicle. 4,120,436, Cl. 224-42.10C.

Bureau, Harvey Lee. Sheet metal tool chest support with sliding work shelf. 4,120,549, Cl. 312-253.000.

Burkhart, William H. Method of cooking food. 4,120,981, Cl. 426-231.000.

Burkholder, Clinton M. Light reflective signaling and warning device. 4,120,561, Cl. 350-99.000.

Burn, Ian, to Sprague Electric Company. Method for making a glass-reacted-ceramic. 4,120,677, Cl. 65-18.000.

Burr-Brown Research Corporation: *See—*
Stitt, Robert M., 4,121,168, Cl. 330-265.000.

Burroughs Corporation: *See—*
Maloney, Thomas C., 4,121,129, Cl. 313-221.000.

Burton, Robert S., III: *See—*
Ridley, Richard D.; and Burton, Robert S., III, 4,120,354, Cl. 166-251.000.

Burtsev, Vladimir Mikhailovich: *See—*
Akushsky, Izrail Yakovlevich; Burtsev, Vladimir Mikhailovich; Duisenov, Bulat Esenovich; Pak, Ivan Timofeevich; and Zhautykov, Anurbek Orymbekovich, 4,121,298, Cl. 364-746.000.

Bush, Louis W.; and Cumming, Allen R., to Westinghouse Electric Corp. Radar altimeter simulator. 4,121,213, Cl. 343-17.700.

Butler, Carl D., to Royal Textile Mills, Inc. Cushioned protector. 4,120,052, Cl. 2-16.000.

Butterfield, James L.: *See—*
Wright, George C.; and Butterfield, James L., 4,121,035, Cl. 542-417.000.
Wright, George C.; and Butterfield, James L., 4,121,036, Cl. 542-417.000.

Byrum, Bernard W., Jr.; Ernsthausen, Roger E.; and Fein, Michael E., to Owens-Illinois, Inc. Gas discharge dielectric containing a source of boron, gallium, indium, or thallium. 4,120,808, Cl. 252-63.200.

Cagliero, Germano, to Marxer, S.p.A. Method of and feed for farming meat poultry especially chickens and guinea fowl. 4,120,977, Cl. 424-285.000.

Cahoy, Roger P., to Gulf Oil Corporation. 2-Acylaminothiazol-4-ylacetamides as post-emergent selective herbicides. 4,120,690, Cl. 71-90.000.

Caillaud, Alain: *See—*
Scillieri, Antoine; and Caillaud, Alain, 4,121,220, Cl. 343-768.000.

Calgon Corporation: *See—*
Raman, Manjeri S., 4,120,815, Cl. 252-341.000.

Calhoun, Fredrick L., to Industrial Dynamics Company, Ltd. Caustic detection system. 4,121,103, Cl. 250-343.000.

Calspan Corporation: *See—*
DePalma, Vito A.; and King, Raymond W., 4,120,585, Cl. 356-71.000.

Campbell, Dudley H.; and Overton, Arthur W., to Stackpole Components Company. Electric switch. 4,121,071, Cl. 200-67.00G.

Campos, Adolph J.; and Michele, Joseph V., to Campos Associates. Rotary internal combustion engine. 4,120,620, Cl. 418-61.00A.

Campos Associates: *See—*
Campos, Adolph J.; and Michele, Joseph V., 4,120,620, Cl. 418-61.00A.

Canadian General Electric Company, Limited: *See—*
Sherburn, Raymond Robert, 4,120,550, Cl. 312-296.000.

Candlin, John Paton; Wilson, Keith Collier; and Pearce, Ronald, to Imperial Chemical Industries Limited. Transition metal composition. 4,121,030, Cl. 526-119.000.

Cannon, William N.; and Eizember, Richard F., to Eli Lilly and Company. Removal of nitrosating agents. 4,120,905, Cl. 260-646.000.

Canon Kabushiki Kaisha: *See—*
Sakaguchi, Keiichi; Komine, Yoshio; Ichiyanagi, Toshikazu; Shimazaki, Mamoru; and Hosoe, Kazuya, 4,120,571, Cl. 352-27.000.
Taguchi, Tatsuya; and Date, Nobuaki, 4,121,231, Cl. 354-38.000.

Carasso, Marino Giuseppe: *See—*
Schampers, Paulus Philippus Maria; Carasso, Marino Giuseppe; and Klostermann, Frits Theodoor, 4,121,255, Cl. 358-223.000.

Carborundum Company, The: *See—*
Boos, Charles John; Hausler, Elwood Benjamin; Hirsch, James Arthur; Kasprzyk, Martin Richard; and Smith, Elmer Gene, 4,120,827, Cl. 252-512.000.
Myles, Thomas Aquinas, 4,120,641, Cl. 432-3.000.

Cardon, Bartley P., to Arizona Feeds. Method for the treatment of diarrhea in monogastric animals. 4,120,952, Cl. 424-180.000.

Carl Krasny & Associates, Inc.: *See—*
Kaplan, Irving Leonard, 4,120,243, Cl. 100-212.000.

Carman, Vincent E. Method for purifying a liquid by pressure distillation. 4,120,756, Cl. 203-11.000.

Carossino, Andre. Clamping device for a machine tool. 4,120,490, Cl. 269-94.000.

Carp, Ralph W.; Ang, Leoncio T.; Leadbetter, Laurence D.; and Cornell, Grant Arthur, to Bendix Corporation, The. Adaptive braking system with special control for slippery surfaces. 4,120,539, Cl. 503-103.000.

Carpenter, Leon G.: *See—*
Carrier, Lee A.; and Carpenter, Leon G., 4,120,445, Cl. 229-53.000.

Carrier Corporation: *See—*
Herb, Carl C.; and Rose, Robert A., 4,120,453, Cl. 236-49.000.
Hopkins, Donald J.; Salyers, John C.; and Goranson, Paul L., 4,120,415, Cl. 220-1.00T.
Whitwell, Robert J.; and Bolton, Theodore S., 4,120,170, Cl. 62-91.000.

Carrier, Lee A.; and Carpenter, Leon G., to Ludlow Corporation. Information-bearing article for conveying information which cannot be surreptitiously detected. 4,120,445, Cl. 229-53.000.

Carroll, Frank E., to Carroll Research, Inc. Building structure. 4,120,131, Cl. 52-310.000.

Carroll, Mark T.: *See—*
Weltman, Henry J.; Carroll, Mark T.; Halkias, John E.; Kaarlela, William T.; and Reynolds, Jack D., 4,121,157, Cl. 324-216.000.

Carroll Research, Inc.: *See—*
Carroll, Frank E., 4,120,131, Cl. 52-310.000.

Cars & Concepts, Inc.: *See—*
Chrysler, Richard R., 4,120,529, Cl. 296-137.00B.

Carter, Joseph M. Sanitary facility for pets. 4,120,264, Cl. 119-1.000.

Carter, Samuel E. Tree stand and seat. 4,120,379, Cl. 182-187.000.

Carter, Thomas P., Jr.: *See—*
Marchessault, Richard G.; Carter, Thomas P., Jr.; and Williams, Martin M., 4,121,028, Cl. 526-48.100.

Cascade Industries, Inc.: *See—*
West, Robert E., 4,120,126, Cl. 52-169.700.

Castellucci, Nicholas T., to PPG Industries, Inc. Method of providing corrosion resistance to metal surfaces. 4,120,996, Cl. 427-318.000.

Cataldo, Thomas R. Switch means for radio alarm device. 4,121,160, Cl. 340-321.000.

Caterpillar Tractor Co.: *See—*
Allen, Royce D.; and Easter, Rollen G., 4,120,511, Cl. 280-795.000.
Diemer, Donald P.; Hafele, Joseph C.; Hawkins, Robert H.; and Simmons, Gerald P., 4,121,085, Cl. 219-121.00L.
Goloff, Alexander; and Ballard, Charles E., 4,120,622, Cl. 418-142.000.
Hafele, Joseph C.; Richards, Thomas J.; and Wright, Paul L., 4,120,261, Cl. 118-630.000.
Lawrence, Dean M., 4,120,527, Cl. 296-28.00C.
Philipsen, R. Dale, 4,120,212, Cl. 74-476.000.
Roley, Robert D.; Haslett, Glenn M.; and Blunier, Dennis L., 4,120,537, Cl. 305-14.000.
Stepe, Visvaldis A., 4,120,105, Cl. 37-142.00R.
Vinton, David S., 4,120,515, Cl. 280-678.000.

Cavaler, Paul. Furniture spring assembly and method for manufacture thereof. 4,120,059, Cl. 5-256.000.

CBS Inc.: *See—*
Finch, Robert A., 4,120,226, Cl. 84-1.030.

Ceintrey, Marcel, to Screg Routes et Travaux Publics. Process for the preparation of a coating composition for roads, airports and industrial floorings. 4,120,832, Cl. 260-2.300.

Celanese Polymer Specialties Company: *See—*
Marchessault, Richard G.; Carter, Thomas P., Jr.; and Williams, Martin M., 4,121,028, Cl. 526-48.100.

Centre de Recherches Metallurgiques-Centrum Voor Research In de Metallurgie: *See—*
Wilmotte, Stephan Hubert; Nautet, Jean Adolphe; and Economopoulos, Marios, 4,120,455, Cl. 239-429.000.

Centronics Data Computer Corp.: *See—*
Howard, Robert, 4,120,594, Cl. 400-697.000.

Cerny, Arnost, to Adamovske strojirny, narodni podnik. Gripper mechanism. 4,120,492, Cl. 271-277.000.

CGR-MeV: *See—*
Azam, Guy; Bensussan, Andre; and Levaillant, Claude, 4,121,173, Cl. 331-9.000.

Chakrabarti, Paritosh Mohan, to GAF Corporation. Anti-static fabric

softening compositions and processes for drying and softening textiles therewith. 4,121,009, Cl. 428-260.000.

Chambley, Phillip W.; and Norris, Alan H., to Champion International Corporation. Fluid self-twist spinning apparatus. 4,120,143, Cl. 57-34.0AT.

Champagne Machine Inc., The: *See—*
Bethurum, George M., 4,120,425, Cl. 222-146.00C.

Champion International Corporation: *See—*
Chambley, Phillip W.; and Norris, Alan H., 4,120,143, Cl. 57-34.0AT.
Tate, Dan C., 4,120,738, Cl. 106-288.00Q.

Champion Spark Plug Company: *See—*
Dulin, Francis H., 4,120,829, Cl. 252-516.000.
Knapp, Randy O., 4,120,733, Cl. 106-48.000.

Chamuel, Jacques R., to Charles Stark Draper Laboratory, Inc., The. Position readout device. 4,121,155, Cl. 324-207.000.

Channon Corporation: *See—*
Mama, Kelly D.; and Roller, Otto C., 4,120,342, Cl. 160-310.000.

Chapin, Robert Stuart: *See—*
Behnke, Wallace Peery; Chapin, Robert Stuart; and Fierro, John Francis, 4,120,914, Cl. 260-857.0TW.

Chapman, Earle F.; and Ruskin, Bernard J. Articulated light fixture. 4,121,280, Cl. 362-418.000.

Chari, Madabushi V.: *See—*
Armor, Anthony F.; Barton, Sterling C.; Chari, Madabushi V.; Collings, Harold E.; and Turnbull, George W., 4,121,126, Cl. 310-59.000.

Charles, Edward David; and Charles, Edward H. Tree-climbing kit. 4,120,377, Cl. 182-3.000.

Charles, Edward H.: *See—*
Charles, Edward David; and Charles, Edward H., 4,120,377, Cl. 182-3.000.

Charles Stark Draper Laboratory, Inc., The: *See—*
Chamuel, Jacques R., 4,121,155, Cl. 324-207.000.
Hamilton, Dean Elwyn; Gaudreau, Marcel Pierre Joseph; and Wu, Alan Leo, 4,120,196, Cl. 73-104.000.

Chateau, Georges M.; and Falkner, Chester B., Jr., to Societe Nationale Elf Aquitaine (Production). Apparatus and method of connecting a flexible line to a subsea station. 4,120,171, Cl. 405-169.000.

Chateau, Georges M.; and Falkner, Chester B., Jr., to Societe Nationale Elf Aquitaine (Production). Subsea station. 4,120,362, Cl. 166-339.000.

Chaum, Erik. Multiple path configuration for a laser interferometer. 4,120,588, Cl. 356-106.0LR.

Chen, Catherine S. H.; Schwab, Frederick C.; and Sheppard, Edward W., to Mobil Oil Corporation. Waterflooding process employing anionic-nonionic copolymer. 4,120,801, Cl. 252-8.55D.

Chen, David Y.: *See—*
Welch, Stanley B.; Serrano, Juan de J.; and Chen, David Y., 4,121,204, Cl. 340-337.000.

Chen, Frank K., to Ultronic Systems Corporation. Automatic alternator for priority circuit. 4,121,285, Cl. 364-200.000.

Chen, Frank T., to Southern Pacific Communications Company (SPCC). Data transmission network interface unit. 4,121,217, Cl. 343-204.000.

Chenel, Pierre; and Moncheaux, Michel Jean, to Saint-Gobain Industries. Multiple pane windows with improved seals. 4,120,999, Cl. 428-34.000.

Cheng, William J.; and Guthrie, David B., to Petrolite Corporation. Copolymers of alpha-olefins and maleic anhydride reacted with amines in the presence of Lewis acids. 4,121,026, Cl. 526-15.000.

Chepel, Lev Vladimirovich: *See—*
Auslender, Vadim Leonidovich; Budker, Gersh Itskovich; Glagolev, Georgy Borisovich; Livshits, Anatoly Alexandrovich; Perepelkin, Vitaly Petrovich; Polyakov, Vladimir Arkhipovich; Chepel, Lev Vladimirovich; Chertok, Ilya Lvovich; and Cheskidov, Vladimir Georgievich, 4,121,086, Cl. 219-121.0EM.

Chertok, Ilya Lvovich: *See—*
Auslender, Vadim Leonidovich; Budker, Gersh Itskovich; Glagolev, Georgy Borisovich; Livshits, Anatoly Alexandrovich; Perepelkin, Vitaly Petrovich; Polyakov, Vladimir Arkhipovich; Chepel, Lev Vladimirovich; Chertok, Ilya Lvovich; and Cheskidov, Vladimir Georgievich, 4,121,086, Cl. 219-121.0EM.

Cheskidov, Vladimir Georgievich: *See—*
Auslender, Vadim Leonidovich; Budker, Gersh Itskovich; Glagolev, Georgy Borisovich; Livshits, Anatoly Alexandrovich; Perepelkin, Vitaly Petrovich; Polyakov, Vladimir Arkhipovich; Chepel, Lev Vladimirovich; Chertok, Ilya Lvovich; and Cheskidov, Vladimir Georgievich, 4,121,086, Cl. 219-121.0EM.

Chevron Research Company: *See—*
Anderson, Donald J., 4,120,357, Cl. 166-272.000.
Davidson, James Melvin, 4,120,911, Cl. 260-674.00A.

Chi, Henry K.; and Higgins, Alton L., to Monsanto Company. Process for polymerizing high nitrile ABS polyblends. 4,120,851, Cl. 260-880.00R.

Chiappetta, Ferdinand; Dykeman, Fred Edgar; and Turner, Paul Allen, to AMSTED Industries Incorporated. Lubricated plastic impregnated wire rope. 4,120,145, Cl. 57-149.000.

Chierici, Osvaldo F.; and Murphy, Richard F., to Holland Company. Coupler shank bearing arrangement for supporting railroad car couplers on coupler carriers. 4,120,404, Cl. 213-61.000.

Childs, Jerry D.; and Love, Roosevelt, to Halliburton Company. Oil well cementing process and composition. 4,120,736, Cl. 106-90.000.

Chinone, Naoki; Kawano, Toshihiro; and Nakajima, Hisao, to Hitachi, Ltd. Semiconductor injection laser. 4,121,179, Cl. 331-94.50H.

Chiyoda Chemical Engineering & Construction Co., Ltd.: *See—*
Morimoto, Tatsuo; Nakamura, Munekazu; Inooka, Masayoshi; and Yawata, Teizaburo, 4,120,780, Cl. 208-211.000.

Chojnacki, Dennis A.: *See—*
Thekdi, Arvind C.; Chojnacki, Dennis A.; and Hemsath, Klaus H., 4,120,639, Cl. 431-158.000.

Chou, Cheng-Chien; and Yee, Clifford Sau Leong, to Wallace Murray Corporation. Sheet metal fan. 4,120,609, Cl. 416-223.00R.

Choy, Kim L. Shopping cart braking apparatus. 4,120,384, Cl. 188-32.000.

Christian, John B.: *See—*
Tamborski, Christ; and Christian, John B., 4,120,863, Cl. 260-307.00D.

Christian, John Hunt; and Overacker, James Leroy, to International Business Machines Corporation. Production control apparatus. 4,120,629, Cl. 425-135.000.

Chrysler, Richard R., to Cars & Concepts, Inc. Removable roof panels for vehicles. 4,120,529, Cl. 296-137.00B.

Chu, Pochen, to Mobil Oil Corporation. Aromatization of ethane. 4,120,910, Cl. 260-673.000.

Ciba-Geigy AG: *See—*
Smith, Norman Alfred; and Kitzing, Rainer, 4,120,898, Cl. 260-561.00S.

Ciba-Geigy Corporation: *See—*
Agarwal, Suresh C.; and Koci, Zdenek, 4,120,648, Cl. 8-85.00R.
Lauton, Alain; and Berendt, Hans-Ulrich, 4,120,647, Cl. 8-17.000.
Spivack, John D.; and Luzzi, John J., 4,120,846, Cl. 260-45.85B.
Wilhelm, Max, 4,120,978, Cl. 424-322.000.

Ciko, John D.; Cramer, John J.; and Jamieson, Geoffrey A., to BASF Wyandotte Corporation. Compositions for souring and softening laundered textile materials, method of preparing the same, and stock solutions prepared therefrom. 4,120,799, Cl. 252-8.600.

Ciko, John D.; Cramer, John J.; and Jamieson, Geoffrey A., to BASF Wyandotte Corporation. Compositions for souring and softening laundered textile materials, method of preparing the same, and stock solutions prepared therefrom. 4,120,802, Cl. 252-8.750.

Cilag-Chemie A.G.: *See—*
Pluss, Kurt; and De Martin, Bruno Romano, 4,120,859, Cl. 260-294.80R.

Cincinnati Milacron Chemicals, Inc.: *See—*
Kugele, Thomas G., 4,120,845, Cl. 260-45.75S.

Cincinnati Milacron Inc.: *See—*
Morser, Alfred Harold; Gibson, Roy; Szekely, Paul; and Parker, Bruce Trayton, 4,121,142, Cl. 318-345.00C.

Cipkowski, Jerome T.: *See—*
Harris, William G.; and Cipkowski, Jerome T., 4,120,413, Cl. 214-394.000.

Citizen Watch Company Limited: *See—*
Murakami, Tomomi, 4,120,147, Cl. 58-50.00R.

City of Hope National Medical Center: *See—*
Tiep, Brian L., 4,120,300, Cl. 128-203.000.

Clampitt, Richard L.: *See—*
Threlkeld, Curtis B.; Hessert, James E.; and Clampitt, Richard L., 4,120,361, Cl. 166-294.000.

Clanan, Wayne N. Snap-on swing-away foot rest for wheel chairs. 4,120,532, Cl. 297-429.000.

Clarion Co., Ltd.: *See—*
Ushio, Yoji; Taketomi, Chiaki; and Asaga, Tutomu, 4,121,262, Cl. 360-13.000.

Clark, Allan: *See—*
Kirkwood, Philip R.; and Clark, Allan, 4,120,440, Cl. 228-231.000.

Clark, Dwight P.; and Wagner, William F., to Thiokol Corporation. Combined filter and incinerator. 4,120,792, Cl. 210-152.000.

Clark, Harold E. Pneumatic mattress with valved cylinders of variable diameter. 4,120,061, Cl. 5-350.000.

Clarke, John W., to Eli Lilly and Company. Refillable tablet package. 4,120,399, Cl. 206-474.000.

Clarke, Peter Alec: *See—*
Molins, Desmond Walter; Hinchcliffe, Dennis; and Clarke, Peter Alec, 4,120,391, Cl. 198-347.000.

Clauder, Otto; Kokosi, Jozsef; Szporny, Laszlo; and Karpati, Egon, to Richter Gedeon Vegyeszeti Gyar Rt. 14-Substituted vincanes. 4,120,858, Cl. 260-293.550.

Clemar Manufacturing Corporation: *See—*
Ruggles, Richard L., 4,121,114, Cl. 307-141.000.

Clements, George William; and Wenshau, Hugo, to Gustafson, Inc. Crosscut sampler for pneumatic conveying systems. 4,120,203, Cl. 73-422.00R.

Clymer, John C.: *See—*
Galanis, Tom L.; Hoffner, Joel L.; Clymer, John C.; Hostetter, Richard S., Jr.; Jones, Duane T.; and Yerkes, Ronald W., 4,121,292, Cl. 364-571.000.
Galanis, Tom L.; Hoffner, Joel L.; Clymer, John C.; and Jones, Duane T., 4,121,294, Cl. 364-571.000.

CMI Corporation: *See—*
Smith, Donald Wayne; Swisher, George W., Jr.; and Teel, Larry W., 4,120,106, Cl. 37-190.000.

Coach and Car Equipment Corporation: *See—*
Harder, Arthur J., Jr., 4,120,533, Cl. 297-451.000.

Coal Industry (Patents) Limited: *See—*
Addison, George Thomas, 4,120,534, Cl. 299-1.000.
Tomlin, Malcolm George, 4,120,164, Cl. 405-289.000.

Coale, Cecil R., Jr., to Texas Instruments Incorporated. Streak reduction system for FLIR display. 4,121,248, Cl. 358-113.000.

Coaltex, Inc.: *See—*
Delli-Gatti, Frank A., Jr., 4,120,535, Cl. 299-18.000.

Codling, Daryl O., to Colt Industries Operating Corp. Tamper proof idle adjusting screws. 4,120,918, Cl. 261-41.00D.

Coffin, Lamar D.; and Opie, William R., to Amax Inc. Segregation-separation of copper from nickel in copper-nickel sulfide concentrates. 4,120,697, Cl. 75-72.000.

Coker, William P.; and Lane, Robert E., Jr., to Dow Chemical Company, The. Oxidation of olefins to oxirane compounds with periodate compounds. 4,120,877, Cl. 260-348.230.

Colborn, Joseph G.: *See—*
Allen, Royce; Sutton, Jerry L.; Griffin, Dan M.; Frye, Hal W.; and Colborn, Joseph G., 4,121,290, Cl. 364-565.000.

Colby, Robert D. Disposable bowling shoe. 4,120,103, Cl. 36-97.000.

Colgate-Palmolive Company: *See—*
Murray, Leo Thomas, 4,120,809, Cl. 252-102.000.

Collings, Harold E.: *See—*
Armor, Anthony F.; Barton, Sterling C.; Chari, Madabushi V.; Collings, Harold E.; and Turnbull, George W., 4,121,126, Cl. 310-59.000.

Collins, Michael H.; and Le Hardy Guiton, Jeremy D., to Shell Internationale Research Maatschappij B.V. Method of producing a barrier in a thermally insulated container. 4,120,418, Cl. 220-444.000.

Colmenero, Gustavo T. Swimming pool alarm system. 4,121,200, Cl. 340-539.000.

Colombani, Bruno; and Pacciarini, Antonio, to Industrie Pirelli S.p.A. Apparatus for setting bead rings on the carcass of a vehicle tire. 4,120,714, Cl. 156-131.000.

Colt Industries Operating Corp.: *See—*
Codling, Daryl O., 4,120,918, Cl. 261-41.00D.

Columbia Chase Corporation: *See—*
Barrett, Walter H., 4,120,288, Cl. 126-271.000.

Combustion Engineering, Inc.: *See—*
Prestridge, Floyd Leon, 4,120,769, Cl. 204-186.000.

Combustion Unlimited Incorporated: *See—*
Straitz, John F., III, 4,120,638, Cl. 431-15.000.

Compagnie General d'Electricite S.A.: *See—*
Fally, Jacques, 4,120,663, Cl. 422-198.000.

Compagnie Generale d'Electricite: *See—*
Dick, Richard; Feuillade, Georges; Gadessaud, Robert; and Nicolas, Louis, 4,121,022, Cl. 429-204.000.

Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C.G. Doris": *See—*
Lamy, Jacques Edouard, 4,120,168, Cl. 405-170.000.

Compagnie Nationale du Rhone: *See—*
Megnint, Lucien, 4,120,602, Cl. 415-1.000.

Computer Identics Corporation: *See—*
Gabeler, Stephen Chester, 4,121,121, Cl. 307-358.000.

Conrow, Ransom Brown; and Bernstein, Seymour, to American Cyanamid Company. Sulfo-m-phenylenebis(sulfonylimino)diisophthalic acid salts. 4,120,894, Cl. 260-507.00R.

Conrow, Ransom Brown; Poletto, John Frank; and Bernstein, Seymour, to American Cyanamid Company. S-phenenyltris (iminocarbonyl) triisophthalic acid salts. 4,120,895, Cl. 562-457.000.

Conrow, Ransom Brown; and Bernstein, Seymour, to America Cyanamid Company. s-Phenenyltris(sulfonylimino)tri-anionic substituted benzene dicarboxylic acids and substituted alkyl amino acids and their salts. 4,120,896, Cl. 562-430.000.

Conrow, Ransom Brown: *See—*
Poletto, John Frank; Conrow, Ransom Brown; and Bernstein, Seymour, 4,120,892, Cl. 260-506.000.
Poletto, John Frank; Conrow, Ransom Brown; and Bernstein, Seymour, 4,120,893, Cl. 260-506.000.

Container Corporation of America: *See—*
Gardner, Jeffrey M.; and Beck, Robert E., 4,120,443, Cl. 229-42.000.
Skaggs, Boyd T., 4,120,442, Cl. 229-15.000.

Continental Group, Inc., The: *See—*
Mascia, Carmen T.; and Hasegawa, Gary K., 4,120,396, Cl. 206-151.000.
Roth, Donald J., 4,120,932, Cl. 264-292.000.

Continental Oil Company: *See—*
Starks, Charles M.; Jackson, Robert G.; Porchey, David V.; and Royer, Dennis J., 4,120,881, Cl. 260-449.60R.

Control Data Corporation: *See—*
Olson, Arthur Barnhart, 4,121,156, Cl. 324-210.000.

Control Devices, Incorporated: *See—*
Krechel, Joseph L.; and Purvis, Michael J., 4,120,319, Cl. 137-583.000.

Cooper France S. A.: *See—*
Villa-Massone, Rene; and Divaret, Michel, 4,120,303, Cl. 128-330.000.

Cooper Laboratories, Inc.: *See—*
Bapatla, Krishna M.; and Brychta, Katharyn M., 4,120,949, Cl. 424-80.000.
Diamond, Julius; and Wohl, Ronald A., 4,120,860, Cl. 260-296.00R.
Diamond, Julius, 4,120,947, Cl. 424-45.000.

Coplin, John Frederick, to Rolls-Royce Limited. Rotor blade for a gas turbine engine. 4,120,607, Cl. 416-2.000.

Corkhill, David P., to Standard Oil Company (Indiana). Seismic data tape recording system. 4,121,191, Cl. 340-15.5DP.

Cornelius Company, The: *See—*
Zygiel, Alfred E., deceased, 4,120,424, Cl. 222-133.000.

Cornell, Grant Arthur: *See—*
Carp, Ralph W.; Ang, Leoncio T.; Leadbetter, Laurence D.; and Cornell, Grant Arthur, 4,120,539, Cl. 503-103.000.

Cornell Iron Works, Inc.: *See—*
Stascavage, John A.; Rawls, William W.; and Buchholz, Alexander, 4,120,340, Cl. 160-133.000.

Cornell Research Foundation, Inc.: *See—*
Bittenson, Steven N.; and Houston, Paul L., 4,120,767, Cl. 204-158.00R.

Correct Count Company Inc.: *See—*
Zohn, Robert Allen; and Zohn, Carole, 4,120,371, Cl. 177-262.000.

Cortex Research Corporation: *See—*
Fosslien, Egil, 4,120,662, Cl. 73-425.600.

Cosma, Earl Jesse; and Tuley, William Bayard, to Ralston Purina Company. Brine mixing apparatus. 4,121,300, Cl. 366-251.000.

Coste, Jean-Francois: *See—*
de Lautrec, Jacques; and Coste, Jean-Francois, 4,120,816, Cl. 252-361.000.

Cotsworth, John L.; and Ilich, Daniel F. Clip for clinching a heat exchange conduit with a solar heat absorber. 4,120,284, Cl. 126-270.000.

Cougoul, Pierre; Saunier, Marc; and Tranchant, Jean Lucien, to Societe Nationale des Poudres et Explosifs. Process for extrusion of pyrotechnical compositions. 4,120,920, Cl. 264-3.00R.

Covington, Cecil E.: *See—*
Braswell, James L.; Covington, Cecil E.; Phillips, Nolan B.; and Snyder, David E., 4,120,610, Cl. 416-226.000.

Cowe, Alan B.; Kubinak, Ronald A.; Pick, George G.; Flanagan, Richard M.; and Szabo, Francis S. Photocomposition machine with keyboard entry and CRT display. 4,121,228, Cl. 354-7.000.

Cox, Allen Ronald; Hatchett, Michael Robert; and Rigbey, Leonard John, to International Business Machines Corporation. Stabilizing backing plate for a flexible disk store. 4,120,505, Cl. 274-39.00R.

Cox, Derek Michael. Fluid seal. 4,120,482, Cl. 251-306.000.

Cragfors, Gunnar: *See—*
Bosson, Jorgen; and Cragfors, Gunnar, 4,120,370, Cl. 177-185.000.

Crambes, Michel; Grangette, Henri; Pivette, Pierre; and Haicour, Philippe, to Societe Nationale Elf Aquitaine. Method for the inhibition of corrosion of ferrous metals in an aqueous medium. 4,120,655, Cl. 422-15.000.

Cramer, John J.: *See—*
Ciko, John D.; Cramer, John J.; and Jamieson, Geoffrey A., 4,120,799, Cl. 252-8.600.
Ciko, John D.; Cramer, John J.; and Jamieson, Geoffrey A., 4,120,802, Cl. 252-8.750.

Cramer, John Joseph: *See—*
Kappler, Frank Robert; Killian, Roma Jean; and Cramer, John Joseph, 4,120,650, Cl. 8-109.000.

Crandell, Walter R., to Fast Heat Element Manufacturing Co. Method of making electrically heated nozzle. 4,120,086, Cl. 29-611.000.

Crandon, Harry D.: *See—*
Laurin, Bernard L.; Rotenberg, Don H.; and Crandon, Harry D., 4,120,992, Cl. 427-164.000.

Crawford, Joe W.: *See—*
Bileski, Thomas; Crawford, Joe W.; Blanton, Bobby D.; Johnson, Carl N.; Garcia, Felix; Orcutt, John W.; Shepherd, Glen C.; and Oursler, James A., 4,121,073, Cl. 200-83.00P.

Credelca A.G.: *See—*
Rodgers, Franklin Bartlett; and Grassl, Herbert, 4,120,133, Cl. 52-745.000.

Credelle, Thomas Lloyd, to RCA Corporation. System for achieving image uniformity in display devices. 4,121,137, Cl. 315-366.000.

Crescenzi, Donald C., to Stewart-Warner Corporation. Dual wheel caster. 4,120,071, Cl. 16-37.000.

Crisafulli, George A., to Gould Inc. Apparatus for detection of synchronism by means of vector difference measurement. 4,121,111, Cl. 307-87.000.

Crittendon, Charles E.: *See—*
Brouwer, Walter G.; MacPherson, Edwin J.; Ames, Ronald B.; Neidermyer, Robert W.; and Crittendon, Charles E., 4,120,861, Cl. 260-302.00D.

Crolius, Richard L., to United States of America, Air Force. Explosively driven plasma current generator. 4,121,123, Cl. 310-10.000.

Cromemco Inc.: *See—*
Walker, James Terrell, 4,121,283, Cl. 364-200.000.

Cropper, Wendell P., to Standard Oil Company (Indiana). Sulfur analysis. 4,120,659, Cl. 23-230.0PC.

Cross, Raymond Peter, to Pilkington Brothers Limited. Method of heat treating glass in a fluidized bed and apparatus therefore. 4,120,680, Cl. 65-114.000.

Cross, Raymond Peter; and Thomas, Derek Edward, to Pilkington Brothers Limited. Method of thermal treatment of glass in a fluidized bed. 4,120,681, Cl. 65-114.000.

Crucible Inc: *See—*
Strange, Robert R.; and Zimmer, James M., 4,120,345, Cl. 164-92.000.

Crutchfield, Marvin M.; and Lannert, Kent P., to Monsanto Company. Diesters of 6-cyano-2,2-tetrahydropyrandicarboxylates. 4,120,874, Cl. 260-345.80R.

CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Dogliotti, Renato; Mazzei, Umberto; and Mengali, Umberto, 4,121,165, Cl. 329-50.000.

CSR Limited: *See—*
Gotthard, Detre, 4,120,745, Cl. 159-27.00B.

Culbertson, Harry M., to Monsanto Company. High ortho etherified resole resins. 4,120,847, Cl. 528-140.000.

Cullis, Herbert M., to Baxter Travenol Laboratories, Inc. Centrifugal liquid processing apparatus with automatically positioned collection port. 4,120,448, Cl. 233-22.000.

Cumming, Allen R.: *See*—
Bush, Louis W.; and Cumming, Allen R., 4,121,213, Cl. 343-17.700.

Cuniberti, Mario: *See*—
Mallory, James D.; Fleck, John F.; and Cuniberti, Mario, 4,120,684, Cl. 65-302.000.

Cure, Omer P., to Electro-Nite Co. Device for collecting samples of molten metals. 4,120,204, Cl. 73-425.40R.

Curran, Roger, to Bangor Punta Operations, Inc. Gun with intermediate support for barrel thereof. 4,120,276, Cl. 124-85.000.

Cusack, Joseph Martin, to RCA Corporation. Method and apparatus for determining a signal of uniform period. 4,121,211, Cl. 343-14.000.

Cutler-Hammer, Inc.: *See*—
Hults, Harold W., 4,121,072, Cl. 200-67.00A.
Long, Eric L., 4,121,069, Cl. 200-67.00A.
Woodard, Tony O., 4,121,065, Cl. 200-42.00T.

Cvetan, Joseph. Post support. 4,120,125, Cl. 52-156.000.

Czaja, Robert F.; and Grabowski, Edward J. J., to Merck & Co., Inc. 7-(Amidinothio)acetamido-7-methoxy cephalosporins. 4,121,041, Cl. 544-21.000.

Czuba, Leonard J.: *See*—
Althuis, Thomas H.; Czuba, Leonard J.; Hess, Hans-Jurgen E.; and Kadin, Saul B., 4,120,962, Cl. 424-251.000.

D G Shelter Products Company: *See*—
Buck, Elwood W., Jr., 4,120,524, Cl. 292-263.000.

Dahlberg, Harry R.: *See*—
Fountain, Gerald F.; Veloz, Jaime; and Dahlberg, Harry R., 4,120,935, Cl. 423-41.000.

Dahm, Manfred: *See*—
Baatz, Gunther; Dahm, Manfred; and Triebeneck, Kurt, 4,120,518, Cl. 282-27.500.

Daicel Ltd.: *See*—
Harada, Yuichi; Ishihara, Tetsuo; and Takahashi, Shigeyuki, 4,121,006, Cl. 428-172.000.

Daimler-Benz Aktiengesellschaft: *See*—
von Koch, Arwed, 4,120,481, Cl. 251-129.000.

Dalrymple, Earl E.: *See*—
Winkler, Edward D.; and Dalrymple, Earl E., 4,120,552, Cl. 339-90.00R.

Daniels, Raymond Alex; Gibson, David Kent; Kummli, Paul; Snell, Spencer Allan; and Ulrich, Michael Henry, to International Business Machines Corporation. Continuously variable reduction scanning optics drive. 4,120,578, Cl. 355-8.000.

Danjo, Hiroyuki: *See*—
Iizuka, Motohiko; Danjo, Hiroyuki; Ikeda, Kazuo; and Yoshimura, Masatoshi, 4,120,488, Cl. 266-281.000.

DAS Design Corporation: *See*—
Seltzer, Daniel A., 4,121,149, Cl. 323-19.000.

Data Recording Instrument Co., Ltd.: *See*—
Derc, Roman, 4,121,265, Cl. 360-78.000.

Date, Nobuaki: *See*—
Taguchi, Tatsuya; and Date, Nobuaki, 4,121,231, Cl. 354-38.000.

David, Guy Albert Jules: *See*—
Leal, Jean-Claude; Vannetzel, Henri; Grima, Jean-Claude; and David, Guy Albert Jules, 4,121,287, Cl. 364-461.000.

Davidson, James Melvin, to Chevron Research Company. Method for concentrating a slurry containing a solid particulate component. 4,120,911, Cl. 260-674.00A.

Davis, Elisha C. Automatic detachable charging head for pressure tank. 4,120,332, Cl. 141-197.000.

Davis, Rock. Power generation system. 4,120,160, Cl. 60-670.000.

Davis, Thomas E. Aquarium divider. 4,120,265, Cl. 119-5.000.

De Francisci Machine Corporation: *See*—
De Francisci, Leonard, 4,121,301, Cl. 99-353.000.

Deb, Satyendra Kumar; and Witzke, Horst, to Optel Corporation. Electrochromic cell with protective overcoat layer. 4,120,568, Cl. 350-357.000.

De Borst, Cornelis: *See*—
Barendsz, Anton Willem; De Borst, Cornelis; Post, Alfred Johannes Antonius; and Schimmel, Joannes, 4,120,754, Cl. 195-99.000.

De Croix, Charles Emile: *See*—
Karp, Edward C.; and De Croix, Charles Emile, 4,120,245, Cl. 101-288.000.

De Francisci, Leonard, to De Francisci Machine Corporation. Continuous-feed alimentary paste mixer and improved noodle-making machine. 4,121,301, Cl. 99-353.000.

De Lancey, Warren H. Carburetors or fuel mixing systems. 4,120,274, Cl. 123-139.00E.

Delattre-Levivier: *See*—
Benoit, Michel, 4,120,643, Cl. 432-36.000.

de Lautrec, Jacques; and Coste, Jean-Francois, to Societe Nationale Elf Aquitaine (Production). Defoaming apparatus. 4,120,816, Cl. 252-361.000.

Dellantonio, Ezio F., to Autovox S.p.A. Keyboard for the preselection of electromagnetic signals. 4,120,207, Cl. 74-10.330.

Delli-Gatti, Frank A., Jr., to Coaltex, Inc. Scoop-belt miner. 4,120,535, Cl. 299-18.000.

DeLuca, John P.; and Maas, Edward T., Jr., to Exxon Research & Engineering Co. Process for conversion of UF_6 to UO_2. 4,120,936, Cl. 423-261.000.

del Valle, Frank; Tuschhoff, John V.; and Streaty, Charles E., to A. E. Staley Manufacturing Company. Hydroxypropylated, epichlorohydrin crosslinked tapioca and corn starch derivatives. 4,120,983, Cl. 426-405.000.

del Valle, Frank: *See*—
Eastman, James E.; and del Valle, Frank, 4,120,982, Cl. 426-405.000.

De Martin, Bruno Romano: *See*—
Pluss, Kurt; and De Martin, Bruno Romano, 4,120,859, Cl. 260-294.80R.

de Mere, Henri Courier, to Bicosa Societe de Recherches. D. C. Power packs, inter alia of the disposable king, for providing a predetermined rated voltage. 4,121,115, Cl. 307-150.000.

Denison, Early B., to Shell Oil Company. Kelly and kelly cock assembly for hard-wired telemetry system. 4,121,193, Cl. 340-18.0CM.

Denka Chemical Corporation: *See*—
Edmondson, Morris S., 4,121,033, Cl. 526-223.000.

Denman, Lee Richard; and Abrams, William Randolph. Offshore pipe laying. 4,120,167, Cl. 405-157.000.

DePalma, Vito A.; and King, Raymond W., to Calspan Corporation. Fingerprint identification system using a pliable optical prism. 4,120,585, Cl. 356-71.000.

de Putter, Warner Jan, to Wavin B.V. Electrically conducting plastic pipe system. 4,120,325, Cl. 138-145.000.

Derc, Roman, to Data Recording Instrument Co., Ltd. Temperature compensation for data storage apparatus. 4,121,265, Cl. 360-78.000.

Dernedde, Robert, to Klein, Schanzlin & Becker Aktiengesellschaft. Flexible shaft coupling. 4,120,175, Cl. 64-15.00B.

Deutschmann, Herbert, to Motoren- und Turbinen-Union Friedrichshafen GmbH. Propulsion arrangement. 4,120,155, Cl. 60-599.000.

Dev Choudhury, Rathindra N., to NCR Corporation. Multiple shift electronic keyboard. 4,121,048, Cl. 178-17.00C.

Devlieg, Garrett Howard, to Boeing Company, The. Aircraft automatic braking system. 4,120,540, Cl. 303-117.000.

De Vries, Martin; Fitzgerald, Harold A., II; Nyhof, Eldon J.; and van Putten, James D., Jr., to Donnelly Mirrors, Inc. Light reflectivity and transmission testing apparatus and method. 4,120,582, Cl. 356-73.000.

Dewallens, Leon, to Fabrication Belge de Disques "Fabeldis". Device for manufacturing substantially flat dies. 4,120,771, Cl. 204-225.000.

Diamond, Julius; and Wohl, Ronald A., to Cooper Laboratories, Inc. 3-Aryl-1-(2- or 4-iminodihydro-1-pyridyl)-2-propanol antiarrhythmic compounds. 4,120,860, Cl. 260-296.00R.

Diamond, Julius, to William H. Rorer, Inc. Ethynylbenzene compounds and derivatives thereof. 4,120,885, Cl. 260-455.00R.

Diamond, Julius, to William H. Rorer, Inc. Cyano ethynylbenzene compounds. 4,120,889, Cl. 260-465.00K.

Diamond, Julius, to Cooper Laboratories, Inc. Xanthine compounds and method of treating bronchospastic and allergic diseases. 4,120,947, Cl. 424-45.000.

Dick, Richard; Feuillade, Georges; Gadessaud, Robert; and Nicolas, Louis, to Compagnie Generale d'Electricite; and Institut National de Recherche Chimique Appliquee Ircha. Poly (2-hydroxyethylmethacrylate) membranes for electrochemical use. 4,121,022, Cl. 429-204.000.

Dick, William J. Telephone command apparatus. 4,121,053, Cl. 179-2.00A.

Dickey-john Corporation: *See*—
Funk, David B.; and Midden, William E., 4,121,151, Cl. 324-61.00R.

Dickey, Raymond G.: *See*—
Oloff, Clarence M.; Karl, Alva A.; Wolff, Walter M.; Halbrook, Lloyd W.; Brown, Ray D.; and Dickey, Raymond G., 4,120,266, Cl. 119-103.000.

Diebold, Joseph M.; Arway, George; and Stone, Joseph James, to A. B. Dick Company. Drop counter ink replenishing system. 4,121,222, Cl. 346-75.000.

Diemer, Donald P.; Hafele, Joseph C.; Hawkins, Robert H.; and Simmons, Gerald P., to Caterpillar Tractor Co. Gas nozzle for laser welding. 4,121,085, Cl. 219-121.00L.

Diesel Kiki Co., Ltd.: *See*—
Isobe, Hiroshi; Koyanagi, Toru; and Sakuranaka, Toru, 4,120,275, Cl. 123-140.0MC.
Kimura, Takeo; and Tomita, Hitoshi, 4,120,456, Cl. 239-464.000.

Dietmann, Karl: *See*—
Kampe, Wolfgang; Senn, Martin; Thiel, Max; Bartsch, Wolfgang; and Dietmann, Karl, 4,120,963, Cl. 424-256.000.

Dietrich, Ralph Nowack; and Robinson, John William, to Kimball International, Inc. Method and apparatus for automatically producing in an electronic organ rhythmic accompaniment manual note patterns. 4,120,225, Cl. 84-1.030.

Di Mauro, Innocenzio: *See*—
Sanci, Salvatore; and Di Mauro, Innocenzio, 4,120,566, Cl. 350-302.000.

Dimensional Development Corporation: *See*—
Lo, Allen Kwok Wah; and Nims, Jerry Curtis, 4,120,562, Cl. 350-130.000.

Dinkler, Leonard R.; and Herrin, Jerry, to General Electric Company. Electromagnetically controlled, temperature-sensitive (ECTS) reed switch with substantially hystersis free operation. 4,121,184, Cl. 335-179.000.

Dipl.-Ing. Hitzinger & Co.: *See*—
Platzer, Hubert, 4,121,148, Cl. 322-59.000.

Director Ing. Fritz Loertscher: *See*—
Mehnert, Walter, 4,120,486, Cl. 254-150.00R.

Dirksing, Robert S., to Procter & Gamble Company, The. Lined parallelepipedal package for dispensing flowable materials. 4,120,420, Cl. 220-416.000.

Divaret, Michel: *See*—
Villa-Massone, Rene; and Divaret, Michel, 4,120,303, Cl. 128-330.000.

DiVito, Ronald J.; and Steck, Howard A., to Driomi, Inc. System for detecting, indicating and regulating the level of semi-solid matter in a reservoir. 4,121,094, Cl. 235-92.0FL.

Dobrosielski, Stephen S.: *See*—
Taylor, Glenn R.; Mullen, John H.; and Dobrosielski, Stephen S., 4,121,076, Cl. 200-280.000.
Dr.-Ing. Rudolf Hell GmbH: *See*—
Preuss, Dieter; and Segin, Peter, 4,121,259, Cl. 358-261.000.
Dr. Johannes Heidenhain GmbH: *See*—
Spies, Alfons, 4,120,093, Cl. 33-174.00P.
Doering, John Peter, to Union Carbide Corporation. Greenhouse door assembly. 4,120,341, Cl. 160-213.000.
Dogliotti, Renato; Mazzei, Umberto; and Mengali, Umberto, to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A. Digital demodulator with interpolation for linearly amplitude-modulated data signals. 4,121,165, Cl. 329-50.000.
Doherty, Michael J., to Microcom Corporation. Integrated programmable commutation and signal conditioning circuit. 4,121,055, Cl. 179-15.00A.
Doi, Toshitada: *See*—
Iga, Akira; and Doi, Toshitada, 4,121,205, Cl. 340-347.0DA.
Doll, Ronald L., to Spirit of America, Inc. Motorcycle headlight tilt control. 4,121,278, Cl. 362-72.000.
Dolz, Heinrich. Plunger compressor. 4,121,125, Cl. 310-27.000.
Donaldson, Robert G., to Raymond Lee Organization, Inc., The. Telephone holder. 4,121,061, Cl. 179-156.00R.
Donnelly Mirrors, Inc.: *See*—
De Vries, Martin; Fitzgerald, Harold A., II; Nyhof, Eldon J.; and van Putten, James D., Jr., 4,120,582, Cl. 356-73.000.
Doremus, John A.; and Kirkpatrick, William R., to Rosemount Inc. Electrically heated air data sensing device. 4,121,088, Cl. 219-201.000.
Dotson, James M.: *See*—
Petersen, George E.; and Dotson, James M., 4,120,786, Cl. 209-454.000.
Douaud, Andre; and Rialan, Joseph, to Institut Francais du Petrole. Device for optimum control of the sparking time of a spark ignition engine, during its operation. 4,120,272, Cl. 123-117.00D.
Dougherty, Thomas John; and Hennen, Roy Erving, to Globe-Union Inc. Portable rechargeable lead-acid battery. 4,121,017, Cl. 429-7.000.
Dow Chemical Company, The: *See*—
Birkelbach, Donald F., 4,120,820, Cl. 252-429.00B.
Brattesani, Donald N., 4,120,862, Cl. 260-307.00D.
Coker, William P.; and Lane, Robert E., Jr., 4,120,877, Cl. 260-348.230.
French, Floyd R., 4,120,430, Cl. 222-324.000.
Heckeroth, Earl T., 4,120,625, Cl. 425-71.000.
Smith, William L.; Kelyman, Jacqueline S.; and Jones, Ladell, 4,120,804, Cl. 252-47.500.
Dowa Mining Co., Ltd.: *See*—
Watanabe, Yasuo; and Isoyama, Seizi, 4,120,806, Cl. 252-62.540.
Watanabe, Yasuo; and Isoyama, Seizi, 4,120,807, Cl. 252-62.620.
Downey, Thomas James; Turnbull, Peter Dennis; and Gayther, James Walter, to Boeing Company, The. Take-off warning system for aircraft. 4,121,194, Cl. 340-27.00R.
Downing, Noel L., to General Motors Corporation. Jet flap controlled fuel pump. 4,120,603, Cl. 415-11.000.
Doyle, Ross L.: *See*—
Harrison, Thomas S.; and Doyle, Ross L., 4,120,414, Cl. 215-307.000.
Drake, Jerry W.; and Portesi, Peter J., to Raytheon Company. Multilayer interconnected structure for semiconductor integrated circuit. 4,121,241, Cl. 357-71.000.
Dresser Industries, Inc.: *See*—
Roesner, Raymond Earl, 4,120,353, Cl. 166-65.00R.
Drew, John Alan. Orthopaedic footwear. 4,120,101, Cl. 36-4.000.
Driomi, Inc.: *See*—
DiVito, Ronald J.; and Steck, Howard A., 4,121,094, Cl. 235-92.0FL.
Duffy, Richard Joseph; and Rodden, Philip James, to USM Corporation. Method of making self-locking fasteners. 4,120,993, Cl. 427-195.000.
Dugan, Judith A., to Magee, David S., a part interest. Educational book. 4,120,100, Cl. 35-73.000.
Duikers, Marcel: *See*—
Michel, Edmond; Duikers, Marcel; and Poty, Andre, 4,120,634, Cl. 425-525.000.
Duisenov, Bulat Esenovich: *See*—
Akushsky, Izrail Yakovlevich; Burtsev, Vladimir Mikhailovich; Duisenov, Bulat Esenovich; Pak, Ivan Timofeevich; and Zhautykov, Anurbek Orymbekovich, 4,121,298, Cl. 364-746.000.
Dulin, Francis H., to Champion Spark Plug Company. Electrically semi-conducting ceramic body. 4,120,829, Cl. 252-516.000.
Dulux Australia Ltd.: *See*—
Gibson, David Vincent; and Leary, Bruce, 4,120,768, Cl. 204-181.00C.
Dunham, Charles L.; and Kiernan, Thomas H., to Gravel-Vac Service Co., Inc. Vacuum operated debris removal apparatus and method for a power broom. 4,120,311, Cl. 134-6.000.
Du Pont de Nemours, E. I., and Company: *See*—
Behnke, Wallace Peery; Chapin, Robert Stuart; and Fierro, John Francis, 4,120,914, Cl. 260-857.0TW.
Bingham, Elena Maria; and Middleton, William Joseph, 4,120,856, Cl. 260-239.30D.
Ehlig, William Hollis, 4,120,939, Cl. 423-483.000.
Fleming, Sydney Winn; and Weeks, Gregory Paul, 4,120,592, Cl. 356-201.000.
Garrison, William Emmett, Jr., 4,121,016, Cl. 428-483.000.
Goddard, Steven Jerome; and Levitt, George, 4,120,693, Cl. 71-96.000.
Goodell, Carol Eve, 4,120,835, Cl. 260-15.000.
Levitt, George, 4,120,691, Cl. 71-93.000.
Manos, Philip, 4,120,098, Cl. 34-9.000.
Pechhold, Engelbert, 4,120,850, Cl. 528-66.000.
Potter, Jerry Fuller, 4,120,222, Cl. 83-99.000.
Pruckmayr, Gerfried; and Weir, Robert H., 4,120,903, Cl. 260-615.00B.
Schwing, Gregory Wayne, 4,120,897, Cl. 260-543.00R.
Trizisky, Joseph Donnelly, 4,120,660, Cl. 23-230.00R.
Wald, David K., 4,121,000, Cl. 428-35.000.
Whitehead, Thomas Wilson, 4,120,450, Cl. 233-26.000.
Durant, Graham John: *See*-
Brown, Thomas Henry; Durant, Graham John; Ganellin, Charon Robin; and Ife, Robert John, 4,120,966, Cl. 424-263.000.
Brown, Thomas Henry; Durant, Graham John; Ganellin, Charon Robin; and Ife, Robert John, 4,120,972, Cl. 424-273.00R.
Durnig, Herbert, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Apparatus for forming a stack composed of layers of round-section elongated items. 4,120,406, Cl. 214-6.00N.
Dutra, Gerard A., to Monsanto Company. Benzyl and aryl esters of N-phosphonomethyl glycines, herbicidal compositions and use thereof. 4,120,689, Cl. 71-86.000.
Dwyer, Niles M.; and Rasins, Janis A., to Breuer Electric Manufacturing Company. Vacuum cleaner-blower assembly with sound absorbing arrangement. 4,120,616, Cl. 417-373.000.
Dye, Malcolm Stuart; Redman, Michael James; and Satchell, David W., to Xerox Corporation. Transceiver system for visible images. 4,121,260, Cl. 358-295.000.
Dykeman, Fred Edgar: *See*—
Chiappetta, Ferdinand; Dykeman, Fred Edgar; and Turner, Paul Allen, 4,120,145, Cl. 57-149.000.
Dynacon Industries, Inc.: *See*—
Michalchik, Michael, 4,120,828, Cl. 252-513.000.
Dynamit Nobel Aktiengesellschaft: *See*—
Haase, Rainer; Hunger, Volker; and Lenz, Arnold, 4,120,938, Cl. 423-332.000.
Titz, Siegfried, 4,120,926, Cl. 264-89.000.
E. Merck: *See*—
Seubert, Jurgen; Pohlke, Rolf; Thomas, Herbert; and Andrews, Peter, 4,120,961, Cl. 424-250.000.
E-Systems, Inc.: *See*—
Bunch, Carroll S.; Perry, Jerry L.; and Marcucci, Robert L., 4,121,216, Cl. 343-113.00R.
Jusko, Stephen C.; and Tillotson, Thomas C., 4,121,058, Cl. 179-15.55T.
Easter, Rollen G.: *See*—
Allen, Royce D.; and Easter, Rollen G., 4,120,511, Cl. 280-795.000.
Eastman, James E.; and del Valle, Frank, to A. E. Staley Manufacturing Company. Hydroxypropylated, epichlorohydrin crosslinked tapioca starch derivative for acid retort media. 4,120,982, Cl. 426-405.000.
Eastman Kodak Company: *See*—
Henry, James W., 4,121,247, Cl. 358-107.000.
Meyer, Max F., Jr.; and McConnell, Richard L., 4,120,916, Cl. 260-897.00A.
Ebbinghaus, Alfred. Universal joint. 4,120,176, Cl. 64-21.000.
Ebel, Robert H.; Spitzer, Donald P.; and Bambrick, William Edward, to American Cyanamid Company. Hydrodesulfurization catalysts based on supports prepared from rehydratable alumina. 4,120,826, Cl. 252-465.000.
Eby, George W. Emergency light bar. 4,120,435, Cl. 224-42.10F.
Echols, Marvin C., to Zap-Lok Systems International, Inc. Method of pipe joining. 4,120,083, Cl. 29-458.000.
Eckels, Phillip William, to Electric Power Research Institute. Multiphasic pump for rotating cryogenic machinery. 4,120,169, Cl. 62-55.000.
Economopoulos, Marios: *See*—
Wilmotte, Stephan Hubert; Nautet, Jean Adolphe; and Economopoulos, Marios, 4,120,455, Cl. 239-429.000.
Eder, Anton Allen, to Idaho Research Foundation, Inc. Solar heat collector. 4,120,283, Cl. 126-270.000.
Edgerton, Harold Eugene; Wyckoff, Charles W.; and Rines, Robert Harvey, to Academy of Applied Science, Inc., The. Method of and apparatus for sonar detection and the like with plural substantially orthogonal radiation beams. 4,121,190, Cl. 340-3.00R.
Edhlund, Ronald D., to American Photo-Graphics Corporation. Font element for photocomposing machine. 4,121,229, Cl. 354-15.000.
Edmaier, Franz, to Motoren- und Turbinen-Union Friedrichshafen GmbH. Ventilating arrangement for an engine compartment. 4,120,271, Cl. 123-41.490.
Edmondson, Morris S., to Denka Chemical Corporation. Chloroprene-sulfur polymerization with di(O-alkylthionothiolcarbonoxy)sulfides. 4,121,033, Cl. 526-223.000.
Edwards, Wales Dale; and White, William Harold, to Harris Corporation. Method of multiplexing liquid crystal displays. 4,121,203, Cl. 340-336.000.
EGYT Gyogyszervegyeszeti Gyar: *See*—
Nagy, Geza; Pungor, Erno; Toth, Klara; Havas, Jeno; and Feher Zsofia, 4,120,657, Cl. 23-230.00R.
Ehlen, Jack W., to McCulloch Corporation. Breakerless magnetc device. 4,120,277, Cl. 123-148.0CC.
Ehlig, William Hollis, to Du Pont de Nemours, E. I., and Company Hydrogen fluoride process. 4,120,939, Cl. 423-483.000.
Ehrlund, Ake, to AB Turn-O-Matic. Strip roll for use in dispensing tickets. 4,121,004, Cl. 428-43.000.

Eiwa Confectionary Co.: *See—*
Abe, Minoru, 4,120,627, Cl. 425-92.000.
Eizember, Richard F.: *See—*
Cannon, William N.; and Eizember, Richard F., 4,120,905, Cl. 260-646.000.
Electric Power Research Institute: *See—*
Eckels, Phillip William, 4,120,169, Cl. 62-55.000.
Electric Power Research Institute, Inc.: *See—*
Ocken, Howard, 4,120,752, Cl. 176-73.000.
Electro-Nite Co.: *See—*
Cure, Omer P., 4,120,204, Cl. 73-425.40R.
Electronique Marcel Dassault: *See—*
Scillieri, Antoine; and Caillaud, Alain, 4,121,220, Cl. 343-768.000.
Elger, Gerald W.; Stadler, Ruth A.; and Sanker, Philip E., to United States of America, Interior. Process for purifying a titanium-bearing material and upgrading ilmenite to synthetic rutile with sulfur trioxide. 4,120,694, Cl. 75-1.00T.
Eli Lilly and Company: *See—*
Cannon, William N.; and Eizember, Richard F., 4,120,905, Cl. 260-646.000.
Clarke, John W., 4,120,399, Cl. 206-474.000.
Ellis, Ralph J.: *See—*
Baghdadi, Aslan; and Ellis, Ralph J., 4,120,743, Cl. 156-620.000.
Ellis, Robert D. Oil slick removal and recovery system. 4,120,788, Cl. 210-30.00A.
Elmore, Glenn V.: *See—*
Ameen, Joseph G.; Elmore, Glenn V.; and Peter, Anthony E., 4,120,843, Cl. 260-33.80R.
Elson, Peter Fred: *See—*
Pamplin, John Warner; Bennett, James Vine; and Elson, Peter Fred, 4,120,186, Cl. 72-278.000.
Eltra Corporation: *See—*
Shiflett, Ned H.; and Seybert, William J., 4,120,555, Cl. 339-126.00R.
Emhart Industries, Inc.: *See—*
Gerlach, John R., 4,120,184, Cl. 70-389.000.
Emmons, William D.; and Stevens, Travis E., to Rohm and Haas Company. Oligomeric amino-containing aminolysis products of polymethacrylates or polyacrylates, and epoxy resin coating compositions containing such aminolysis products as curing agents. 4,120,839, Cl. 260-29.2EP.
Endersz, Gyorgy Geza; and Forsberg, Gunnar Stefan, to Telefonaktiebolaget L M Ericsson. Optical receiver. 4,121,095, Cl. 250-199.000.
Energy Development Associates: *See—*
Hart, Thomas Gordon, 4,120,774, Cl. 204-294.000.
Energy Modification, Inc.: *See—*
Gleim, William K. T., 4,120,664, Cl. 44-1.00R.
Engel, Hugo George, to Superior Tool & Manufacturing Company. Elbow planter box. 4,120,119, Cl. 47-66.000.
Engel, Stephen August, to Union Carbide Corporation. Method and apparatus for reducing smoke and preventing secondary fins during scarfing. 4,120,703, Cl. 148-9.500.
English, Alan: *See—*
Atchison, Walter D.; English, Alan; and Halter, Donald, 4,120,698, Cl. 75-82.000.
English, James, to BOC Limited. Photoelectrically controlled line follower apparatus. 4,121,097, Cl. 250-202.000.
Epstein, James; and Brissette, William P., to GTE Laboratories Incorporated. Ultra-thin button-type primary electrochemical cell. 4,121,020, Cl. 429-162.000.
Erickson, Clifford A.; Finley, Joseph H.; Blumbergs, John H.; and Scholer, Fred R., to FMC Corporation. Disulfones as peroxygen activators. 4,120,651, Cl. 8-111.000.
Erickson, Clifford W., to Honeywell Inc. Proximity sensor. 4,120,389, Cl. 192-129.00A.
Erickson Tool Company: *See—*
Benjamin, Milton L., 4,120,601, Cl. 408-226.000.
Erikson, Rolf B.: *See—*
Flint, John R.; Erikson, Rolf B.; and Rabindran, George, 4,121,138, Cl. 318-7.000.
Ernst, Arnold E., to Ernst, Arnold E. Root crop harvester. 4,120,363, Cl. 171-58.000.
Ernsthausen, Roger E., to Owens-Illinois, Inc. Dielectric for multiple gaseous discharge display/memory panel having improved voltage characteristics. 4,121,133, Cl. 313-518.000.
Ernsthausen, Roger E.: *See—*
Byrum, Bernard W., Jr.; Ernsthausen, Roger E.; and Fein, Michael E., 4,120,808, Cl. 252-63.200.
ESB Corporation: *See—*
Turillon, Pierre Paul; Hull, Michael Neill; and Nordblom, George Frederick, 4,121,024, Cl. 429-245.000.
Espy, Patrick N. Solar radiation reflector and collector array. 4,120,282, Cl. 126-270.000.
Etablissements Francois Salomon et Fils: *See—*
Salomon, Georges Pierre Joseph, 4,120,064, Cl. 12-142.00R.
Etablissements Poutrait-Morin S.A.: *See—*
Bouder, Paul C., 4,120,614, Cl. 417-63.000.
Etat Francais: *See—*
Fournier, Jean-Claude; and Hermitte, Albert, 4,121,136, Cl. 315-205.000.
Eterno, John R.: *See—*
Grindstaff, Donald A.; and Eterno, John R., 4,120,989, Cl. 426-577.000.
Ethicon, Inc.: *See—*
Mandel, Harvey B.; and Thyen, Eberhard H., 4,120,395, Cl. 206-63.300.
Ethyl Corporation: *See—*
Malec, Robert E., 4,120,803, Cl. 252-51.50A.
Evers, Robert C.; and Abraham, Tonson, to United States of America, Air Force. Fluorocarbon bis(o-aminophenol) compounds containing a hydrocarbon moiety. 4,120,900, Cl. 260-571.000.
Exxon Production Research Company: *See—*
Brooks, Fred A., Jr., 4,120,166, Cl. 405-225.000.
Exxon Research & Engineering Co.: *See—*
Baird, William Chalmers, Jr.; Bearden, Roby, Jr.; and Bollinger, Ralph Louis, Jr., 4,120,779, Cl. 208-108.000.
DeLuca, John P.; and Maas, Edward T., Jr., 4,120,936, Cl. 423-261.000.
Hulme, Roger, 4,120,912, Cl. 260-683.470.
Fa Alfred Hansel, Nieten-Und Metallwarenfabrik: *See—*
Schwab, Manfred, 4,120,188, Cl. 72-391.000.
Fabrication Belge de Disques "Fabeldis": *See—*
Dewallens, Leon, 4,120,771, Cl. 204-225.000.
Fadden, Delmar McLean; Habbestad, Alvin Richard; and Veitengruber, James Edwin, to Boeing Company, The. Ground impact point prediction system concept for airdrops. 4,121,246, Cl. 358-103.000.
Fahey, Darryl R.; and Mahan, John E., to Phillips Petroleum Company. Bis(μ-diphenylphosphido)tris(triethylphosphine)dinickel oligomerization of 1,3 butadiene. 4,120,907, Cl. 260-666.00B.
Fairchild Camera and Instrument Corporation: *See—*
Frazee, Jerome A., 4,121,141, Cl. 318-326.000.
Falkenstein, Georg: *See—*
Woerner, Frank Peter; Kan, Peter T.; and Falkenstein, Georg, 4,120,884, Cl. 260-453.0SP.
Falkner, Chester B., Jr.: *See—*
Chateau, Georges M.; and Falkner, Chester B., Jr., 4,120,171, Cl. 405-169.000.
Chateau, Georges M.; and Falkner, Chester B., Jr., 4,120,362, Cl. 166-339.000.
Fally, Jacques, to Compagnie General d'Electricite S.A. Hydrogen generating device. 4,120,663, Cl. 422-198.000.
Farber, Joseph. Ridged surface solar heater. 4,120,286, Cl. 126-271.000.
Fast Heat Element Manufacturing Co.: *See—*
Crandell, Walter R., 4,120,086, Cl. 29-611.000.
Fatutto, Pierluigi, to Montedison S.p.A. Modified polyols. 4,120,834, Cl. 521-164.000.
Fayos, D. Jose Antonio Navarro, to Montajes Electronicos Dorcas S.A. Safety fastening. 4,120,523, Cl. 292-268.000.
Fedorovskaya, Elena Alexeevna: *See—*
Liverant, Vladimir Leibovich; Yagupolsky, Lev Moiseevich; Ilichenko, Andrei Yakovlevich; Timashpolskaya, Faina Borisovna; Fedorovskaya, Elena Alexeevna; Petrik, Lidia Ivanovna; Kalantarov, Iosif Yakubovich; Kopylova, Mira Semenovna; and Meitus, Idima Evgenievna, 4,120,855, Cl. 260-153.000.
Fefferman, Frank J., to Stylar Industries, Inc. Vehicle chair and seat belt arrangement for chair. 4,120,531, Cl. 297-349.000.
Feher, Zsofia: *See—*
Nagy, Geza; Pungor, Erno; Toth, Klara; Havas, Jeno; and Feher, Zsofia, 4,120,657, Cl. 23-230.00R.
Fein, Michael E.: *See—*
Byrum, Bernard W., Jr.; Ernsthausen, Roger E.; and Fein, Michael E., 4,120,808, Cl. 252-63.200.
Ferranti Limited: *See—*
Kerr, Andrew Guy; and Morley, Robert Arthur, 4,121,293, Cl. 364-463.000.
Fett, Helmut. Apparatus for training the telecontrol of a model helicopter or the like. 4,120,099, Cl. 35-12.00K.
Feucht, Dennis LeRoy, to Tektronix, Inc. Automatic trigger circuit. 4,121,164, Cl. 328-181.000.
Feuerherm, Harald. Extrusion press head for the extrusion of tubular strands of plastic material. 4,120,633, Cl. 425-462.000.
Feuillade, Georges: *See—*
Dick, Richard; Feuillade, Georges; Gadessaud, Robert; and Nicolas, Louis, 4,121,022, Cl. 429-204.000.
Fierro, John Francis: *See—*
Behnke, Wallace Peery; Chapin, Robert Stuart; and Fierro, John Francis, 4,120,914, Cl. 260-857.0TW.
Fikart, Josef L., to GTE Lenkurt Electric (Canada) Ltd. Low-noise microwave signal generator. 4,121,163, Cl. 328-16.000.
Finch, Robert A., to CBS Inc. Circuit for reiterating percussive sounds in electronic musical instrument. 4,120,226, Cl. 84-1.030.
Fink, William F., to Roberton & Schwartz. Tie-down tensioning device. 4,120,077, Cl. 24-130.000.
Finley, Joseph H.: *See—*
Erickson, Clifford A.; Finley, Joseph H.; Blumbergs, John H.; and Scholer, Fred R., 4,120,651, Cl. 8-111.000.
Firestone Tire & Rubber Company, The: *See—*
Vicic, John Charles; and Reynard, Kennard Anthony, 4,120,838, Cl. 260-29.1SB.
Firmenich SA: *See—*
Renold, Walter; Skorianetz, Werner; Schulte-Elte, Karl-Heinrich; and Ohloff, Gunther, 4,120,830, Cl. 252-522.000.
Fischbeck, Kenneth H.; and Vernon, Richard H., to Xerox Corporation. Ink jet array with isolated fluid rectifier layers. 4,121,227, Cl. 346-140.00R.
Fischer, Gunther: *See—*
Hanisch, Gerhard; Fischer, Gunther; Gahler, Seigfried; Franz, Udo; Kuschel, Karl; Mayer, Roland; Bach, Gunther; and Junge, Karl-Wilhelm, 4,120,726, Cl. 96-107.000.
Fischer, Hans-Otto, to Rhein-Flugzeugbau GmbH. Remotely piloted vehicle. 4,120,468, Cl. 244-13.000.

Fischer, Paul W.; Pye, David S.; and Gallus, Julius P., to Union Oil Company of California. Method for drilling a well through unconsolidated dolomite formations. 4,120,369, Cl. 175-72.000.

Fisons Limited: *See—*
Gates, Peter Stuart; Gillon, John; and Saggers, David Thomas, 4,120,871, Cl. 260-343.30R.
Orr, Thomas Samuel Campbell; and Kingsley, Patrick John, 4,120,975, Cl. 424-283.000.

Fitzgerald, Harold A., II: *See—*
De Vries, Martin; Fitzgerald, Harold A., II; Nyhof, Eldon J.; and van Putten, James D., Jr., 4,120,582, Cl. 356-73.000.

Fitzgerald, Maurice J., to Polaroid Corporation. Polymeric cyanoalkyl acrylate silver halide peptizer. 4,120,727, Cl. 96-114.000.

Fixel, Irving E. Implant to secure the greater trochanter. 4,120,298, Cl. 128-92.00D.

Flanagan, Joseph E., to Rockwell International Corporation. Nonmetallized solid fluorine oxidizer gas generator. 4,120,708, Cl. 149-17.000.

Flanagan, Richard M.: *See—*
Cowe, Alan B.; Kubinak, Ronald A.; Pick, George G.; Flanagan, Richard M.; and Szabo, Francis S., 4,121,228, Cl. 354-7.000.

Fleck, John F.: *See—*
Mallory, James D.; Fleck, John F.; and Cuniberti, Mario, 4,120,684, Cl. 65-302.000.

Fleischer, Helmut, to Robert Bosch GmbH. Vehicle speed control system with dual interrupt safety circuit. 4,120,373, Cl. 180-105.00E.

Fleming, Sydney Winn; and Weeks, Gregory Paul, to Du Pont de Nemours, E. I., and Company. Multiplex optical analyzer apparatus. 4,120,592, Cl. 356-201.000.

Flint, John R.; Erikson, Rolf B.; and Rabindran, George, to Bell & Howell Company. Servo system. 4,121,138, Cl. 318-7.000.

Flippin, James S.: *See—*
Nissen, Roland N.; and Flippin, James S., 4,120,366, Cl. 172-805.000.

Flottweg-Werk Dr. Georg Bruckmayer GmbH & Co. KG: *See—*
Jager, Ernst Adolf, 4,120,447, Cl. 233-7.000.

Fly, James Alan; and Slonaker, Robert O., to Owens-Corning Fiberglas Corporation. Quality control for fibrous mats. 4,120,191, Cl. 73-9.000.

FMC Corporation: *See—*
Erickson, Clifford A.; Finley, Joseph H.; Blumbergs, John H.; and Scholer, Fred R., 4,120,651, Cl. 8-111.000.
Lutz, Charles William, 4,120,812, Cl. 252-186.000.
Scholer, Fred R.; and Blumbergs, John H., 4,120,652, Cl. 8-111.000.

Fodor, Lawrence M.; and Kitchen, Alonzo G., to Phillips Petroleum Company. Styrene-diene$_1$-diene$_2$ block terpolymer with improved thermal stability. 4,120,915, Cl. 260-880.00B.

Fontenelle, James Francis. Rotatable multiple filament lamp and socket adapter. 4,121,134, Cl. 315-64.000.

Ford Motor Company: *See—*
Meyer, Fred J.; and Newman, Seymour, 4,120,844, Cl. 260-42.000.

Forney, Edger Wilmot, Jr.: *See—*
Bianchi, Edward Armond; and Forney, Edger Wilmot, Jr., 4,120,554, Cl. 339-97.00R.

Forsberg, Gunnar Stefan: *See—*
Endersz, Gyorgy Geza; and Forsberg, Gunnar Stefan, 4,121,095, Cl. 250-199.000.

Forster, Siegfried; Quell, Peter; and Sack, Berthold, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Nuclear energy plant with closed working gas circuit. 4,120,750, Cl. 176-60.000.

Fosslien, Egil, to Cortex Research Corporation. Specimen sampling apparatus. 4,120,662, Cl. 73-425.600.

Fountain, Gerald F.; Veloz, Jaime; and Dahlberg, Harry R., to Inspiration Consolidated Copper Company. Dump leaching of copper. 4,120,935, Cl. 423-41.000.

Four Star, Inc.: *See—*
Jones, John B.; and Upton, Robert W., 4,120,405, Cl. 214-1.0HH.

Fournier, Jean-Claude; and Hermitte, Albert, to Etat Francais. Apparatus for feeding discharge lamps from a direct current source. 4,121,136, Cl. 315-205.000.

Fraley, Lowell David, to Pullman Incorporated. Method for removing entrained melt from a gaseous stream. 4,120,668, Cl. 55-72.000.

Francel, Josef; King, James E.; and Woulbroun, John M., to Owens-Illinois, Inc. Sealing glass vehicle and composition and method for making same. 4,120,678, Cl. 65-32.000.

Frank L. Wells Company: *See—*
Sturm, Helmut, 4,120,392, Cl. 198-451.000.

Franks, Lawrence L.; and Gomersall, David W., to Inland Steel Company. Process for producing one-side galvanized sheet material. 4,120,997, Cl. 427-367.000.

Franz, Udo: *See—*
Hanisch, Gerhard; Fischer, Gunther; Gahler, Seigfried; Franz, Udo; Kuschel, Karl; Mayer, Roland; Bach, Gunther; and Junge, Karl-Wilhelm, 4,120,726, Cl. 96-107.000.

Franzen, Gustav, to Palitex Project Company GmbH. Yarn injection mechanism for cooperation with pneumatic yarn threading devices of a textile yarn processing machine. 4,120,142, Cl. 57-34.00R.

Frater, Georg; Pfiffner, Albert; Suchy, Milos; and Zurfluh, Rene, to Hoffmann-La Roche Inc. Certain epoxy compounds in admixture as insect regulating agents. 4,120,974, Cl. 424-278.000.

Frazee, Jerome A., to Fairchild Camera and Instrument Corporation. D.C. motor speed control circuitry. 4,121,141, Cl. 318-326.000.

French, Floyd R., to Dow Chemical Company, The. Pump dispensing package. 4,120,430, Cl. 222-324.000.

French, John Barry; Reid, Neil M.; and Buckley, Janette A., to University of Toronto, The Governing Council of the. Method and apparatus for focussing and declustering trace ions. 4,121,099, Cl. 250-296.000.

Fromm, Hermann Dieter: *See—*
Gettert, Hans; Fromm, Hermann Dieter; Molzahn, Martin; Schier, Ernst-Juergen; and Schneehage, Hans Henning, 4,120,667, Cl. 55-48.000.

Fruhwirth, Rudolf. Cigarette dispenser. 4,120,423, Cl. 221-115.000.

Frye, Hal W.: *See—*
Allen, Royce; Sutton, Jerry L.; Griffin, Dan M.; Frye, Hal W.; and Colborn, Joseph G., 4,121,290, Cl. 364-565.000.

Fuchs, Dieter. Castor. 4,120,432, Cl. 222-565.000.

Fuemmeler, Vincent F. Newspaper delivery receptacle. 4,120,446, Cl. 232-17.000.

Fuji Photo Film Co., Ltd.: *See—*
Arai, Noboru, 4,121,251, Cl. 358-150.000.
Fujita, Susumu; Kushibe, Seijiro; and Shimizu, Hiroshi, 4,121,235, Cl. 354-234.000.
Hara, Hiroshi; and Nakamura, Kotaro, 4,120,723, Cl. 96-74.000.
Ikenoue, Shinpei; and Masuda, Takao, 4,120,728, Cl. 96-114.100.
Matsumoto, Seiji; Takahashi, Isoji; Komaki, Takao; Ishida, Masamitsu; Kozeki, Tomotaka; Horikawa, Kazuo; and Shimanuki, Kozi, 4,121,101, Cl. 250-315.00A.
Nakazyo, Kiyoshi; Sakaguchi, Shinji; and Tsuji, Nobuo, 4,120,725, Cl. 96-97.000.
Ohmura, Hiroshi; and Kohashi, Akira, 4,121,230, Cl. 354-21.000.
Okamoto, Yoshihiko; and Ohta, Takahiro, 4,120,722, Cl. 96-49.000.
Takahashi, Koji; Akimoto, Taizo; Watanabe, Shigeru; and Terashita, Takaaki, 4,120,581, Cl. 355-38.000.
Tatsuta, Sumitaka; Yamamoto, Nobuo; and Tsuji, Nobuo, 4,120,724, Cl. 96-87.00A.
Yamashita, Hiroshi; Osawa, Sadao; Saida, Takashi; and Sakasai, Yutaka, 4,120,805, Cl. 252-62.10L.

Fujikura, Yoshiaki: *See—*
Inamoto, Yoshiaki; Aigami, Koji; Ohsugi, Motoyoshi; Ikeda, Hiroshi; and Fujikura, Yoshiaki, 4,120,906, Cl. 260-648.00C.

Fujino, Hitoshi, to Alps Electric Co., Ltd. Change-over slide switch with grounding spring member. 4,121,062, Cl. 200-16.00F.

Fujishiro, Takeshi, to Nissan Motor Company, Limited. Compensation for inherent fluctuation in output level of exhaust sensor in air-fuel ratio control system for internal combustion engine. 4,120,269, Cl. 123-32.0EE.

Fujita, Hiroshi; and Kato, Kazuhisa, to NGK Insulators, Ltd. Corona shield for tension insulator assembly. 4,121,046, Cl. 174-141.00R.

Fujita, Hiroshi: *See—*
Yamada, Mankichi; and Fujita, Hiroshi, 4,121,045, Cl. 174-141.00R.

Fujita, Masayuki: *See—*
Kubo, Sueki; Watanabe, Toshiro; Fujita, Masayuki; Matsuno, Tadahiko; and Morita, Akira, 4,120,260, Cl. 118-317.000.

Fujita, Susumu; Kushibe, Seijiro; and Shimizu, Hiroshi, to Fuji Photo Film Co., Ltd. Electromagnetically operated shutter mechanism. 4,121,235, Cl. 354-234.000.

Fujiwara, Akira: *See—*
Ogawa, Hiromichi; Inoue, Kenji; and Fujiwara, Akira, 4,121,021, Cl. 429-162.000.

Fukushima, Nobuo; Uemura, Yukikazu; Okumura, Takuzo; and Hayashida, Haruo, to Sumitomo Chemical Company, Limited. Method of manufacturing oriented amorphous aromatic polymeric films. 4,120,931, Cl. 264-288.000.

Fukuyama, Yosinobu: *See—*
Takatori, Osho; Nishikawa, Etsuo; and Fukuyama, Yosinobu, 4,120,251, Cl. 112-121.150.

Funk, David B.; and Midden, William E., to Dickey-john Corporation. Analysis instrument. 4,121,151, Cl. 324-61.00R.

Furukawa, Hiroshi: *See—*
Kamiyama, Setsuo; Kaneko, Katsumi; Nagashima, Yukio; Furukawa, Hiroshi; and Wada, Shozo, 4,120,908, Cl. 260-668.00A.

Furukawa, Kaoru; Matsunami, Koichi; Ota, Toshihiko; Murakami, Tetsushi; Nagai, Hiroshi; and Tamaki, Kazuo, to Toyo Boseki Kabushiki Kaisha. Production of biaxially stretched film of polyamide blend. 4,120,928, Cl. 264-171.000.

Furusato, Masayasu: *See—*
Sakurai, Hisaya; Morita, Hideo; Ikegami, Tadashi; Maeda, Katsuaki; and Furusato, Masayasu, 4,120,883, Cl. 260-448.00A.

Fusco, Raffaele, to ANIC, S.p.A. Method for the purification of sewage waters which contain organic compounds of an anionic nature. 4,120,789, Cl. 210-54.000.

Futaba Denshi Kogyo Kabushiki Kaisha: *See—*
Morimoto, Kiyoshi, 4,120,700, Cl. 148-1.500.

Gabeler, Stephen Chester, to Computer Identics Corporation. Follower response control circuit. 4,121,121, Cl. 307-358.000.

Gadessaud, Robert: *See—*
Dick, Richard; Feuillade, Georges; Gadessaud, Robert; and Nicolas, Louis, 4,121,022, Cl. 429-204.000.

GAF Corporation: *See—*
Chakrabarti, Paritosh Mohan, 4,121,009, Cl. 428-260.000.
Parthasarathy, R.; and Hort, Eugene Victor, 4,121,039, Cl. 560-244.000.

Gahler, Seigfried: *See—*
Hanisch, Gerhard; Fischer, Gunther; Gahler, Seigfried; Franz, Udo; Kuschel, Karl; Mayer, Roland; Bach, Gunther; and Junge, Karl-Wilhelm, 4,120,726, Cl. 96-107.000.

Galanis, Tom L.; Hoffner, Joel L.; Clymer, John C.; Hostetter, Richard S., Jr.; Jones, Duane T.; and Yerkes, Ronald W., to Bethlehem Steel Corporation. Electro-optical gaging system having dual cameras on a scanner. 4,121,292, Cl. 364-571.000.

Galanis, Tom L.; Hoffner, Joel L.; Clymer, John C.; and Jones, Duane

T., to Bethlehem Steel Corporation. Electro-optical gaging system. 4,121,294, Cl. 364-571.000.

Galanis, Tom L.: *See*—
Hoffner, Joel L.; and Galanis, Tom L., 4,121,291, Cl. 364-571.000.

Galanti, Maurice R. G., to Institut National du Verre. Installation for superficially treating the outer surfaces of bottles. 4,120,682, Cl. 65-181.000.

Gallus, Julius P.: *See*—
Fischer, Paul W.; Pye, David S.; and Gallus, Julius P., 4,120,369, Cl. 175-72.000.

Gamewell Corporation, The: *See*—
Solomon, Elias E., 4,121,105, Cl. 250-381.000.

Ganellin, Charon Robin; and Young, Rodney Christopher, to Smith Kline & French Laboratories Limited. Heterocyclic alkylaminocyclobutenediones. 4,120,968, Cl. 424-263.000.

Ganellin, Charon Robin; and Young, Rodney Christopher, to Smith Kline & French Laboratories Limited. Imidazolyl alkylaminocyclobutenediones. 4,120,973, Cl. 424-273.00R.

Ganellin, Charon Robin: *See*—
Brown, Thomas Henry; Durant, Graham John; Ganellin, Charon Robin; and Ife, Robert John, 4,120,966, Cl. 424-263.000.
Brown, Thomas Henry; Durant, Graham John; Ganellin, Charon Robin; and Ife, Robert John, 4,120,972, Cl. 424-273.00R.

Gange, Robert Allen, to RCA Corporation. Cathode structure and method of operating the same. 4,121,130, Cl. 313-302.000.

Garcia, Felix: *See*—
Bileski, Thomas; Crawford, Joe W.; Blanton, Bobby D.; Johnson, Carl N.; Garcia, Felix; Orcutt, John W.; Shepherd, Glen C.; and Oursler, James A., 4,121,073, Cl. 200-83.00P.

Garde, Lawrence, to Magnetic Peripherals Inc. Dual loop phase locked oscillator system. 4,121,172, Cl. 331-1.00A.

Gardner, Jeffrey M.; and Beck, Robert E., to Container Corporation of America. Cushioning insert. 4,120,443, Cl. 229-42.000.

Garofalo, Nicholas J. Portable pneumatic nut running tool having air shut-off controls. 4,120,604, Cl. 415-25.000.

Garrett Corporation, The: *See*—
McInerney, Charles E., 4,120,156, Cl. 60-602.000.

Garrett, Nelson Lee, Jr., to Garrett Plante Corporation. Lead-acid storage battery. 4,121,019, Cl. 429-94.000.

Garrett Plante Corporation: *See*—
Garrett, Nelson Lee, Jr., 4,121,019, Cl. 429-94.000.

Garrison, William Emmett, Jr., to Du Pont de Nemours, E. I., and Company. Composition of vinyl chloride polymer and two acrylic polymers which can be reinforced with polyester. 4,121,016, Cl. 428-483.000.

Gates, Peter Stuart; Gillon, John; and Saggers, David Thomas, to Fisons Limited. 5-Organosulfonyl, 5-organosulfinyl or 5-haloalkanoyl-benzofuran-2-ones. 4,120,871, Cl. 260-343.30R.

Gaudreau, Marcel Pierre Joseph: *See*—
Hamilton, Dean Elwyn; Gaudreau, Marcel Pierre Joseph; and Wu, Alan Leo, 4,120,196, Cl. 73-104.000.

Gaylord, Norman G., to Syntex (U.S.A.) Inc. Method for correcting visual defects, compositions and articles of manufacture useful therein. 4,120,570, Cl. 351-40.000.

Gayther, James Walter: *See*—
Downey, Thomas James; Turnbull, Peter Dennis; and Gayther, James Walter, 4,121,194, Cl. 340-27.00R.

Geck, Gunther; and Langhammer, Jurgen, to Klockner-Werke AG. Process for the production of steel. 4,120,696, Cl. 75-13.000.

Gedeit, Reinhold C. External heat engine. 4,120,161, Cl. 60-682.000.

Gehring, Karl; and Kamm, Kurt, to Pohlig-Heckel-Bleichert Vereinigte Maschinen-Fabriken. Bridge scraper. 4,120,408, Cl. 214-10.000.

General Binding Corporation: *See*—
Staats, Henry N., 4,120,517, Cl. 281-19.00R.

General Dynamics Corporation: *See*—
Aston, Richard, 4,121,174, Cl. 331-48.000.
Mullen, Roger F., 4,120,187, Cl. 72-342.000.
Weltman, Henry J.; Carroll, Mark T.; Halkias, John E.; Kaarlela, William T.; and Reynolds, Jack D., 4,121,157, Cl. 324-216.000.

General Electric Company: *See*—
Armor, Anthony F.; Barton, Sterling C.; Chari, Madabushi V.; Collings, Harold E.; and Turnbull, George W., 4,121,126, Cl. 310-59.000.
Dinkler, Leonard R.; and Herrin, Jerry, 4,121,184, Cl. 335-179.000.
Harmon, Larry R., 4,121,079, Cl. 219-10.55B.
Hillig, William B.; and Morelock, Charles R., 4,120,731, Cl. 106-44.000.
Hobson, Charles F., Jr., 4,121,269, Cl. 361-44.000.
Kelley, Fred William, Jr., 4,121,150, Cl. 323-102.000.
LeBlanc, Oliver H., Jr.; Niedrach, Leonard W.; and Stoddard, William H., Jr., 4,120,292, Cl. 128-2.00E.
Petersen, George E.; and Dotson, James M., 4,120,786, Cl. 209-454.000.
Terhune, James H.; and Neissel, John P., 4,121,106, Cl. 250-390.000.
Tsai, Reysen, 4,121,271, Cl. 361-82.000.
Welch, Stanley B.; Serrano, Juan de J.; and Chen, David Y., 4,121,204, Cl. 340-337.000.
Wolfinger, John F., 4,121,272, Cl. 361-236.000.

General Enterprises Corp., Ltd.: *See*—
Simos, Rigas Christos, 4,120,628, Cl. 425-131.100.

General Motors Corporation: *See*—
Downing, Noel L., 4,120,603, Cl. 415-11.000.
Greene, Pliney O., Jr.; and Pendleton, Darrell D., 4,120,543, Cl. 308-233.000.

General Signal Corporation: *See*—
Auer, John H., Jr., 4,120,471, Cl. 246-128.000.

Genth, Hermann: *See*—
Paulus, Wilfried; and Genth, Hermann, 4,120,686, Cl. 71-67.000.

Genz, Earl James, to Illinois Tool Works Inc. Linear position sensor. 4,121,185, Cl. 336-110.000.

Gerlach, John R., to Emhart Industries, Inc. Lock with normally non-removable key and auxiliary key removal device for use in interior locksets. 4,120,184, Cl. 70-389.000.

Germeraad, Paul B.: *See*—
Gotcher, Alan J.; Germeraad, Paul B.; and Jansons, Viktors, 4,121,001, Cl. 428-35.000.

Gertz, Wilhelm: *See*—
Adelski, Hans-Joachim; and Gertz, Wilhelm, 4,121,127, Cl. 310-67.00R.

Gettert, Hans; Fromm, Hermann Dieter; Molzahn, Martin; Schier, Ernst-Juergen; and Schneehage, Hans Henning, to BASF Aktiengesellschaft. Isolation of pure ammonia from gas mixtures containing ammonia and carbon dioxide. 4,120,667, Cl. 55-48.000.

Gewerkschaft Eisenhutte Westfalia: *See*—
Stuckmann, Dieter; and Jutte, Hans, 4,120,165, Cl. 405-145.000.

Gibbs, Hyatt McDonald; McCall, Samuel Leverte, Jr.; and Venkatesan, Thirumalai Nallan Chakravarthy, to Bell Telephone Laboratories, Incorporated. Amplifying characteristics of a cavity-enclosed nonlinear medium. 4,121,167, Cl. 330-4.300.

Gibson, David Kent: *See*—
Daniels, Raymond Alex; Gibson, David Kent; Kummli, Paul; Snell, Spencer Allan; and Ulrich, Michael Henry, 4,120,578, Cl. 355-8.000.

Gibson, David Vincent; and Leary, Bruce, to Dulux Australia Ltd. Process for electrocoating aqueous coating composition comprising dispersion in water of ionizable salt of epoxy amine adduct. 4,120,768, Cl. 204-181.00C.

Gibson, Roy: *See*—
Morser, Alfred Harold; Gibson, Roy; Szekely, Paul; and Parker, Bruce Trayton, 4,121,142, Cl. 318-345.00C.

Gikis, Benjamin J.: *See*—
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Gilbert Associates, Inc.: *See*—
Smith, Robert H., 4,120,735, Cl. 106-84.000.

Gildemeister Corpoplast GmbH: *See*—
Appel, Adolf; and Reymann, Wolfgang, 4,120,636, Cl. 425-541.000.

Giles, Richard F.: *See*—
LaSpisa, Ronald J.; and Giles, Richard F., 4,120,630, Cl. 425-142.000.

Gillon, John: *See*—
Gates, Peter Stuart; Gillon, John; and Saggers, David Thomas, 4,120,871, Cl. 260-343.30R.

Gingrich, Reynard W., to Hooker Chemicals & Plastics Corp. Multiple steam chest series flow evaporator. 4,120,746, Cl. 159-47.00R.

Gissane, William James Mason, to Imperial Chemical Industries Limited. Display device having visible pattern. 4,121,202, Cl. 340-324.00M.

Glagolev, Georgy Borisovich: *See*—
Auslender, Vadim Leonidovich; Budker, Gersh Itskovich; Glagolev, Georgy Borisovich; Livshits, Anatoly Alexandrovich; Perepelkin, Vitaly Petrovich; Polyakov, Vladimir Arkhipovich; Chepel, Lev Vladimirovich; Chertok, Ilya Lvovich; and Cheskidov, Vladimir Georgievich, 4,121,086, Cl. 219-121.0EM.

Glassman, Aaron, to Pennsylvania Sewing Research Corp. Hemmer attachment for a sewing machine. 4,120,252, Cl. 112-143.000.

Gleim, William K. T., to Energy Modification, Inc. Production of low-sulfur coal powder from the disintegration of coal. 4,120,664, Cl. 44-1.00R.

Glitsch, Inc.: *See*—
McClain, Robert W., 4,120,919, Cl. 261-114.0TC.

Globe-Union Inc.: *See*—
Dougherty, Thomas John; and Hennen, Roy Erving, 4,121,017, Cl. 429-7.000.

Globus, Alfred R., to Guardian Chemical Corporation. Process for recovery of bituminous material from tar sands. 4,120,777, Cl. 208-11.0LE.

Glover, Leon C.; and Lopez, Eugene F., to Raychem Corporation. Polymeric article coated with a thermochromic paint. 4,121,011, Cl. 428-347.000.

Goddard, Steven Jerome; and Levitt, George, to Du Pont de Nemours, E. I., and Company. Substituted isoindoles. 4,120,693, Cl. 71-96.000.

Godtschalck, Lucien Joseph, to Krieg & Zivy Industries. Interlocking drawer assembly. 4,120,551, Cl. 312-330.00R.

Goerden, Leonhard: *See*—
Kloker, Werner; Bovender, Franz; Gromping, Franz; Goerden, Leonhard; and Niesel, Harald, 4,120,923, Cl. 264-45.300.

Goldberg, Norton Robert. Can opener for use with ring-type opener tabs. 4,120,216, Cl. 81-3.46A.

Golden, David E.; and Ormonde, Stephan M. Atomic and molecular resonance laser. 4,121,176, Cl. 331-94.50G.

Goldfarb, Adolph E.; and Benkoe, Erwin. Target game with releasable objects and rotating target member. 4,120,497, Cl. 273-95.00B.

Goldfischer, Lester Irving, to Singer Company, The. Two dimensional MIPS. 4,121,210, Cl. 343-8.000.

Goldstein, Gideon, to Sloan-Kettering Institute for Cancer Research. Polypeptide hormones of the thymus. 4,120,951, Cl. 424-177.000.

Goldstein, Raymond: *See*—
Vali, Victor; Shorthill, Richard W.; Goldstein, Raymond; and Krogstad, Reuben S., 4,120,587, Cl. 356-106.0LR.

Goloff, Alexander; and Ballard, Charles E., to Caterpillar Tractor Co. Static oil seal assembly. 4,120,622, Cl. 418-142.000.

Gomersall, David W.: *See—*
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Goodell, Carol Eve, to Du Pont de Nemours, E. I., and Company. Thermosetting acrylic enamel containing iron pyrophosphate. 4,120,835, Cl. 260-15.000.
Goodman, Lawrence Alan; Levine, Aaron William; and Meyerhofer, Dietrich, to RCA Corporation. Electro-optic device. 4,120,567, Cl. 350-350.000.
Goranson, Paul L.: *See—*
Hopkins, Donald J.; Salyers, John C.; and Goranson, Paul L., 4,120,415, Cl. 220-1.00T.
Gordon, Abraham: *See—*
Adler, Stanford L.; and Gordon, Abraham, 4,120,262, Cl. 118-642.000.
Gotcher, Alan J.; Germeraad, Paul B.; and Jansons, Viktors, to Raychem Corporation. Crosslinking agent for polymers and wire construction utilizing crosslinked polymers. 4,121,001, Cl. 428-35.000.
Gotthard, Detre, to CSR Limited. Semi-continuous vacuum pan system. 4,120,745, Cl. 159-27.00B.
Goudriaan, Frans; and Van Klinken, Jakob, to Shell Oil Company. Process for the conversion of hydrocarbons in atmospheric crude residue. 4,120,778, Cl. 208-80.000.
Gould Inc.: *See—*
Crisafulli, George A., 4,121,111, Cl. 307-87.000.
Parkinson, David B.; and Parkinson, Truman D., 4,121,023, Cl. 429-211.000.
Uritis, Joseph M., 4,120,464, Cl. 242-72.00R.
Grabowski, Edward J. J.: *See—*
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Grafinger, Wilhelm: *See—*
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Grafosol S.p.A.: *See—*
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Graham, James: *See—*
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Grallert, Michael; and Moschner, Jorg, to Rollei-Werke Franke & Heidecke. Multiple film type motion picture projection. 4,120,572, Cl. 352-92.000.
Grangette, Henri: *See—*
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Grant, Louis R., Jr.: *See—*
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Grant, R. Peter: *See—*
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Grassl, Herbert: *See—*
Rodgers, Franklin Bartlett; and Grassl, Herbert, 4,120,133, Cl. 52-745.000.
Gravel-Vac Service Co., Inc.: *See—*
Dunham, Charles L.; and Kiernan, Thomas H., 4,120,311, Cl. 134-6.000.
Gray, Lionel Cedric Nall. Securing devices. 4,120,444, Cl. 229-49.000.
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Greater Glasgow Health Board: *See—*
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Green Cross Corporation, The: *See—*
Homma, Yuzuru, 4,120,950, Cl. 424-87.000.
Greene, Pliney O., Jr.; and Pendleton, Darrell D., to General Motors Corporation. Unitized sealed ball thrust bearing. 4,120,543, Cl. 308-233.000.
Greenfield, Stanley A.: *See—*
Seidel, Michael C.; von Meyer, William C.; and Greenfield, Stanley A., 4,120,864, Cl. 260-308.00R.
Greenway, Thomas H., to Technical Research and Manufacturing, Inc. Broadband directional coupler. 4,121,180, Cl. 333-10.000.
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Allen, Royce; Sutton, Jerry L.; Griffin, Dan M.; Frye, Hal W.; and Colborn, Joseph G., 4,121,290, Cl. 364-565.000.
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Grindstaff, Donald A.; and Eterno, John R., to Stauffer Chemical Company. High protein pasta formulation. 4,120,989, Cl. 426-577.000.
Groeber, Alfred: *See—*
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Groff, Edwin I.; and Groff, Edwin Terry. Oven heating system. 4,120,646, Cl. 432-121.000.
Groff, Edwin Terry: *See—*
Groff, Edwin I.; and Groff, Edwin Terry, 4,120,646, Cl. 432-121.000.
Gromping, Franz: *See—*
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Gross, Frank C., to Scott Paper Company. Combined means for accurately positioning electrostatographic recording members during imaging and means for establishing electrical connection with the intermediate conductive layer thereof. 4,120,720, Cl. 96-1.50N.
Grossman, Eugene L.: *See—*
Knepper, Jay C.; and Grossman, Eugene L., 4,120,355, Cl. 166-259.000.
Groupement Atomique Alsacienne Atlantique: *See—*
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Grubbs, William J. Liquid carrier and dispenser apparatus for vehicles. 4,120,426, Cl. 222-183.000.
GTE Laboratories Incorporated: *See—*
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GTE Lenkurt Electric (Canada) Ltd.: *See—*
Fikart, Josef L., 4,121,163, Cl. 328-16.000.
GTE Sylvania Incorporated: *See—*
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Gudeman, William J., to Universal Water Systems, Inc. Process for sealing end caps to filter cartridges. 4,120,711, Cl. 156-69.000.
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Gulf Oil Corporation: *See—*
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Gustafson, Inc.: *See—*
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Gustav Weyland KG: *See—*
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Gutcho, Sidney; and McCarter, Henry, to Becton, Dickinson & Company. Substrate coated with receptor and labeled ligand for assays. 4,120,945, Cl. 424-1.000.
Guthrie, David B.: *See—*
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Haag, Franz; and Bongartz, Paul, to Motan Gesellschaft mit beschrankter Haftung. Filtering arrangement for vacuum loaders. 4,120,674, Cl. 55-302.000.
Haans, Petrus Franciscus Antonius: *See—*
van Esdonk, Johannes; and Haans, Petrus Franciscus Antonius, 4,121,131, Cl. 313-402.000.
Haas, Eckhard: *See—*
Krause, Walter; Bober, Peter; and Haas, Eckhard, 4,120,273, Cl. 123-122.00G.
Haase, Rainer; Hunger, Volker; and Lenz, Arnold, to Dynamit Nobel Aktiengesellschaft. Aqueous solutions of alkali polysilicates. 4,120,938, Cl. 423-332.000.
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Fadden, Delmar McLean; Habbestad, Alvin Richard; and Veitengruber, James Edwin, 4,121,246, Cl. 358-103.000.
Haber, David A. Snap-locking hinge. 4,120,074, Cl. 16-171.000.
Habermann, Helmut; Brunet, Maurice; and Joly, Pierre, to Societe Anonyme dite: Societe Europeene de Propulsion. Device for compensating synchronous disturbances in the magnetic suspension of a rotor. 4,121,143, Cl. 318-629.000.
Habib, Robert. Control stepping device. 4,120,208, Cl. 74-128.000.
Hadersbeck, Hans; Andrascek, Ernst; and Groeber, Alfred, to Siemens Aktiengesellschaft. Flexible through-contacted printed circuits. 4,121,044, Cl. 174-68.500.
Hafele, Joseph C.; Richards, Thomas J.; and Wright, Paul L., to Caterpillar Tractor Co. Electrostatic coating system. 4,120,261, Cl. 118-630.000.
Hafele, Joseph C.: *See—*
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Haga, Yukio: *See—*
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Hahn, David T., to Ralston Purina Company. Protein snack product of improved structural integrity. 4,120,988, Cl. 426-573.000.
Hahn, William Peter; Hite, Edward Lee; Shisler, Donald Eugene; and Simmers, Charles Donald, to Johns-Manville Corporation. Method and apparatus for producing blankets of mineral fibers. 4,120,676, Cl. 65-4.00R.
Haicour, Philippe: *See—*
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Halbrook, Lloyd W.: *See—*
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Hale, Edgar C.; and Troy, Stephen R. Method and apparatus for tracing electrical cables. 4,121,152, Cl. 324-66.000.
Halkias, John E.: *See—*
Weltman, Henry J.; Carroll, Mark T.; Halkias, John E.; Kaarlela, William T.; and Reynolds, Jack D., 4,121,157, Cl. 324-216.000.

Hall, John B.: *See*—
Light, Kenneth K.; Sanders, James Milton; Vock, Manfred Hugo; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja Dulal; Tseng, Ching Y.; and Sprecker, Mark A., 4,120,308, Cl. 131-17.00R.

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Childs, Jerry D.; and Love, Roosevelt, 4,120,736, Cl. 106-90.000.

Halomet AG: *See*—
Nowak, Rudolf; and Holland, Gerhard, 4,120,941, Cl. 423-592.000.

Halter, Donald: *See*—
Atchison, Walter D.; English, Alan; and Halter, Donald, 4,120,698, Cl. 75-82.000.

Hamil, Roy A.; and Johnson, Alfred L., to United States of America, Air Force. Gas bearing suspended rotating laser window unit. 4,121,175, Cl. 331-94.50D.

Hamilton, Dean Elwyn; Gaudreau, Marcel Pierre Joseph; and Wu, Alan Leo, to Charles Stark Draper Laboratory, Inc., The. Production tool wear detector. 4,120,196, Cl. 73-104.000.

Hamilton, Floyd E.: *See*—
Tomsic, Walter J.; and Hamilton, Floyd E., 4,120,193, Cl. 73-40.000.

Hamm, Klaus: *See*—
Beck, Otto; and Hamm, Klaus, 4,120,235, Cl. 93-33.00H.

Hammann, Ingeborg: *See*—
Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Hammann, Ingeborg; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,120,956, Cl. 424-200.000.

Hamner, James W.; Hightower, James O.; and Rector, Carl M., to Thiokol Corporation. Technique for improving processibility of certain composite propellants by calcining the iron oxide burning rate catalyst. 4,120,709, Cl. 149-19.920.

Hanisch, Gerhard; Fischer, Gunther; Gahler, Seigfried; Franz, Udo; Kuschel, Karl; Mayer, Roland; Bach, Gunther; and Junge, Karl-Wilhelm, to VEB Filmfabrik Wolfen. Silver-halide emulsion sensitized with an asymmetrical disulfide. 4,120,726, Cl. 96-107.000.

Hanna Mining Company, The: *See*—
Atchison, Walter D.; English, Alan; and Halter, Donald, 4,120,698, Cl. 75-82.000.

Hanni, Manfred, to Siemens Aktiengesellschaft. Radio system. 4,121,158, Cl. 325-55.000.

Hanning Elektro-Werke Robert Hanning: *See*—
Neumann, Gernot, 4,120,057, Cl. 5-66.000.

Hans, Richard G.: *See*—
Richardson, Donald G.; and Hans, Richard G., 4,120,984, Cl. 426-412.000.

Hanson, Goodwin F. Plastic injection molded bow compass. 4,120,092, Cl. 33-27.00B.

Happak, Heinz; and Wittmann, Alfred, to Siemens Aktiengesellschaft. Housing for an electrical or electronic apparatus. 4,120,545, Cl. 312-7.00R.

Hara, Akio: *See*—
Nomura, Toshio; Asai, Tsuyoshi; Yamamoto, Takaharu; and Hara, Akio, 4,120,719, Cl. 75-238.000.

Hara, Clarence M. Carrier for skis and ski poles. 4,120,437, Cl. 224-45.00S.

Hara, Hiroshi; and Nakamura, Kotaro, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive element. 4,120,723, Cl. 96-74.000.

Harada, Yuichi; Ishihara, Tetsuo; and Takahashi, Shigeyuki, to Daicel Ltd. Coated polyolefin film. 4,121,006, Cl. 428-172.000.

Harder, Arthur J., Jr., to Coach and Car Equipment Corporation. Cantilevered supporting shell for seat. 4,120,533, Cl. 297-451.000.

Harmon, Larry R., to General Electric Company. Minimizing lamp flicker and blower speed variation in a microwave oven employing duty cycle power level control. 4,121,079, Cl. 219-10.55B.

Harnsberger, Bobby G., to Texaco Inc. Method for forming a non-dissoluble sand control pack and a sand control pack made thereby. 4,120,359, Cl. 166-278.000.

Harnsberger, Bobby G., to Texaco Inc. Sand consolidation composition. 4,120,842, Cl. 260-33.6UA.

Harrington, John H.; Smyth, Richard T.; and Weir, John D., to Metco, Inc. Method and apparatus for shielding the effluent from plasma spray gun assemblies. 4,121,082, Cl. 219-76.160.

Harris Corporation: *See*—
Beasom, James D., 4,120,707, Cl. 148-186.000.
Edwards, Wales Dale; and White, William Harold, 4,121,203, Cl. 340-336.000.
Mason, Donald R., 4,120,706, Cl. 148-175.000.

Harris, William G.; and Cipkowski, Jerome T., to United States of America, Army. Self load/unload transporter. 4,120,413, Cl. 214-394.000.

Harrison, Thomas S.; and Doyle, Ross L., to Sterling Drug Inc. Self-venting cap. 4,120,414, Cl. 215-307.000.

Harsha, Karnamadakala Sreenivasaacharlu Sree: *See*—
Bachmann, Klaus Jurgen; Schmidt, Paul Herman; Spencer, Edward Guerrant; and Harsha, Karnamadakala Sreenivasaacharlu Sree, 4,121,238, Cl. 357-16.000.

Hart, Thomas Gordon, to Energy Development Associates. Reduction of electrode overvoltage. 4,120,774, Cl. 204-294.000.

Hartenstein, Johannes; and Satzinger, Gerhard, to Warner-Lambert Company. Aporphine derivatives. 4,120,964, Cl. 424-258.000.

Hartig, Gunter Fritz. Pulse generator. 4,121,112, Cl. 307-106.000.

Hartmann, Heribert; and Wess, Guenter, to Siemens Aktiengesellschaft. Tunable oscillator with high stability and accurate frequency. 4,121,170, Cl. 331-1.00A.

Hartwich, Siegfried, to Massey-Ferguson Services N.V. Joints. 4,120,372, Cl. 180-9.500.

Hasbrouck, Gene B.: *See*—
Temple, Philip A.; Hasbrouck, Gene B.; and Howe, Stanley M., 4,120,124, Cl. 52-122.000.

Hasegawa, Akira, to Japan Steel Works, Ltd., The. Gas-hydraulic pressure type actuator for pipeline valve. 4,120,478, Cl. 251-31.000.

Hasegawa, Gary K.: *See*—
Mascia, Carmen T.; and Hasegawa, Gary K., 4,120,396, Cl. 206-151.000.

Hashiguchi, Soichi: *See*—
Taniguchi, Taizo; Iwasaki, Itsutoshi; Takeshige, Toshihiko; Onizuka, Koji; and Hashiguchi, Soichi, 4,120,734, Cl. 106-67.000.

Hashimoto, Yoshio: *See*—
Nakamura, Toshio; Hoshide, Yasuo; Hashimoto, Yoshio; Suzuki, Kenichi; and Yoshida, Yohji, 4,121,037, Cl. 544-313.000.

Haslett, Glenn M.: *See*—
Roley, Robert D.; Haslett, Glenn M.; and Blunier, Dennis L., 4,120,537, Cl. 305-14.000.

Hassall, Anthony George, to N. Greening Limited. Screening apparatus. 4,120,784, Cl. 209-399.000.

Hatanaka, Hideo; Murakami, Yoshinobu; and Morimoto, Kazuhisa, to Matsushita Electric Industrial Co., Ltd. Hygroscopic resin and humidity sensor using the same. 4,120,813, Cl. 252-194.000.

Hatchett, Michael Robert: *See*—
Cox, Allen Ronald; Hatchett, Michael Robert; and Rigbey, Leonard John, 4,120,505, Cl. 274-39.00R.

Hauni-Werke Korber & Co. K.G.: *See*—
Reuland, Joachim, 4,120,194, Cl. 73-45.200.

Hausler, Elwood Benjamin: *See*—
Boos, Charles John; Hausler, Elwood Benjamin; Hirsch, James Arthur; Kasprzyk, Martin Richard; and Smith, Elmer Gene, 4,120,827, Cl. 252-512.000.

Havas, Jeno: *See*—
Nagy, Geza; Pungor, Erno; Toth, Klara; Havas, Jeno; and Feher, Zsofia, 4,120,657, Cl. 23-230.00R.

Hawkins, Robert H.: *See*—
Diemer, Donald P.; Hafele, Joseph C.; Hawkins, Robert H.; and Simmons, Gerald P., 4,121,085, Cl. 219-121.00L.

Hayashi, Yoshiaki, to Matsushita Electric Industrial Co., Ltd. High speed feeding and rewinding mechanism in a magnetic tape recording and reproducing apparatus. 4,121,267, Cl. 360-85.000.

Hayashi, Yoshimasa: *See*—
Nakajima, Yasuo; Hayashi, Yoshimasa; and Waku, Makio, 4,121,064, Cl. 200-19.00A.

Hayashida, Haruo: *See*—
Fukushima, Nobuo; Uemura, Yukikazu; Okumura, Takuzo; and Hayashida, Haruo, 4,120,931, Cl. 264-288.000.

Hazen Research, Inc.: *See*—
Kindig, James K.; and Turner, Ronald L., 4,120,665, Cl. 44-1.00R.

Headen, William E., to Brown & Sharpe Manufacturing Company. Pillow block including plurality of self-aligning linear motion bearings. 4,120,538, Cl. 308-6.00C.

Heat Trace Limited: *See*—
Wainwright, Geoffrey Hugh, 4,121,093, Cl. 219-528.000.

Heberlein Maschinenfabrik AG.: *See*—
Brehm, Gustav, 4,120,144, Cl. 57-77.400.

Heckeroth, Earl T., to Dow Chemical Company, The. Die face cutter. 4,120,625, Cl. 425-71.000.

Heeren, Hermann, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Plant comprising a power station and a cooling tower. 4,120,162, Cl. 60-690.000.

Heeres, Jan, to Janssen Pharmaceutica N.V. 2-Aryl-1,3-dioxolanes. 4,120,869, Cl. 260-340.90R.

Heian, Glenn A.; and Kohl, Robert F., to Allis-Chalmers Corporation. System for handling high sulfur materials. 4,120,645, Cl. 432-106.000.

Heidelberger Druckmaschinen Aktiengesellschaft: *See*—
Wirz, Arno, 4,120,244, Cl. 101-230.000.

Hein, Paul Richard: *See*—
Ketley, Arthur Donald; Hein, Paul Richard; and Yang, Michael Wen-Chien, 4,120,721, Cl. 96-36.300.

Heiser, Joachim; Bernhardt, Wolfgang; and Schempp, Roland, to Robert Bosch GmbH. Hydraulic control system for at least two consumers. 4,120,233, Cl. 91-511.000.

Heisig, Charles P., to Allis-Chalmers Corporation. Safety start switch and power takeoff control valve arrangement. 4,120,374, Cl. 180-53.00R.

Hellgren, Hans Arthur; and Marklund, Karl Georg Erhard, to Renholmens Mekaniska Verkstad AB. Method and apparatus for trimming timber. 4,120,333, Cl. 144-312.000.

Hemsath, Klaus H.: *See*—
Thekdi, Arvind C.; Chojnacki, Dennis A.; and Hemsath, Klaus H., 4,120,639, Cl. 431-158.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Blum, Helmut; and Worms, Karl-Heinz, 4,120,890, Cl. 260-502.40P.
Smolka, Heinz, 4,120,653, Cl. 8-137.000.

Hennen, Roy Erving: *See*—
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Henningsen, Bent Aage, to Novo Industri A/S. Method and apparatus for collecting mucosa. 4,120,656, Cl. 422-28.000.

Henry, James W., to Eastman Kodak Company. Population and profile display of transparent bodies in a transparent mass. 4,121,247, Cl. 358-107.000.

Herb, Carl C.; and Rose, Robert A., to Carrier Corporation. Air distribution unit. 4,120,453, Cl. 236-49.000.

Herbemont, Francoise: *See—*
Queuille, Andre; and Herbemont, Francoise, 4,120,946, Cl. 424-4.000.
Hercules Incorporated: *See—*
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Herion, Dieter: *See—*
Martin, Wolfgang; Bauer, Wolfgang; Herion, Dieter; Linge, Hermann; and Knopp, Hans, 4,120,078, Cl. 28-252.000.
Herman Miller, Inc.: *See—*
Propst, Robert L.; and Propst, Paul L., 4,120,422, Cl. 221-88.000.
Hermitte, Albert: *See—*
Fournier, Jean-Claude; and Hermitte, Albert, 4,121,136, Cl. 315-205.000.
Herr, John A.; and Transue, James A., to Singer Company, The. Direct drive feed system for sewing machines. 4,120,254, Cl. 112-158.00E.
Herrin, Jerry: *See—*
Dinkler, Leonard R.; and Herrin, Jerry, 4,121,184, Cl. 335-179.000.
Hess, Hans-Jurgen E.: *See—*
Althuis, Thomas H.; Czuba, Leonard J.; Hess, Hans-Jurgen E.; and Kadin, Saul B., 4,120,962, Cl. 424-251.000.
Hessert, James E.: *See—*
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Heuer-Leonidas S.A.: *See—*
Prinz, Francois, 4,120,296, Cl. 128-2.05T.
Hewes, Donald R. Belt supported camera caddy. 4,120,434, Cl. 224-5.00V.
Hibbard, Earl R., to Teknekron, Inc. Image registration system for video camera. 4,121,245, Cl. 358-102.000.
Hickam, William M., to Westinghouse Electric Corp. Magnetic tape type sensors, method and apparatus using such magnetic tape sensors. 4,121,288, Cl. 364-497.000.
Higashi, Fukuji: *See—*
Yamazaki, Noboru; and Higashi, Fukuji, 4,120,853, Cl. 260-112.50R.
Higashi, Toshihiko: *See—*
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Chi, Henry K.; and Higgins, Alton L., 4,120,851, Cl. 260-880.00R.
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Hilbert, Ferdinand, to Siemens Aktiengesellschaft. High current protection in a solid electrolytic capacitor. 4,121,277, Cl. 361-433.000.
Hildebrandt, Bernhard: *See—*
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Hill, Thomas A. Apparatus for integration of fluid dilution curves. 4,120,295, Cl. 128-2.05F.
Hill, William Frank, to Lucas Industries Limited. Battery charging systems for road vehicles. 4,121,146, Cl. 320-48.000.
Hillard, Thomas Gerald, to Brown, John S., a part interest. Wheeled skateboards. 4,120,510, Cl. 280-87.04A.
Hillard, Thomas Gerald: *See—*
Brown, John Steven; and Hillard, Thomas Gerald, 4,120,508, Cl. 280-11.280.
Hillig, William B.; and Morelock, Charles R., to General Electric Company. Method of making molten silicon infiltration reaction products and products made thereby. 4,120,731, Cl. 106-44.000.
Hilliker, Stephen Earl: *See—*
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Hintsch, Otto; and Stauner, Rudolf, to Sulzer Brothers Limited. Gripper shuttle for picking in weaving machines. 4,120,329, Cl. 139-196.200.
Hirai, Seizaburo: *See—*
Takahashi, Hiroshi; Hirai, Seizaburo; and Abo, Toshio, 4,120,841, Cl. 260-29.60H.
Hirooka, Masaaki: *See—*
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Hirsch, James Arthur: *See—*
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Hirshman, Justin L.; and Russo, Robert V., to M&T Chemicals Inc. Novel curing agents derived from organothiostannoic acids. 4,120,875, Cl. 260-346.110.
Hitachi Denshi Kabushiki Kaisha: *See—*
Mima, Yoshitada; Kubushiro, Naoaki; and Kojima, Koji, 4,120,589, Cl. 356-121.000.
Hitachi, Ltd.: *See—*
Chinone, Naoki; Kawano, Toshihiro; and Nakajima, Hisao, 4,121,179, Cl. 331-94.50H.
Katto, Hisao, 4,121,240, Cl. 357-52.000.
Kubozoe, Morioki; Minamikawa, Yoshihisa; and Katagiri, Shinjiro, 4,121,100, Cl. 250-311.000.
Matsumoto, Hiroshi; Nakano, Yoshiyuki; Higashi, Toshihiko; and Yasumoto, Akihiro, 4,120,159, Cl. 60-667.000.
Omori, Hideyuki; Otubo, Osamubo; and Ohuchi, Yoshio, 4,121,223, Cl. 346-75.000.
Saiki, Yukimi; Oguino, Masanori; and Watanabe, Shutoku, 4,121,252, Cl. 358-169.000.
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Hahn, William Peter; Hite, Edward Lee; Shisler, Donald Eugene; and Simmers, Charles Donald, 4,120,676, Cl. 65-4.00R.
Hobbs, Charles F.; and McMackins, Dudley E., to Monsanto Company. Production of primary and secondary amines by reaction of ammonia with conjugated diene in the presence of Pd/phosphine catalyst and primary or secondary aliphatic alcohol solvent medium. 4,120,901, Cl. 260-585.00D.
Hobson, Charles F., Jr., to General Electric Company. Ground fault signal circuit for circuit breaker trip unit. 4,121,269, Cl. 361-44.000.
Hodges, Kenneth James Hamer: *See—*
Venton, Peter Charles; Blench, Michael; Sutherland, Anthony Keith; and Hodges, Kenneth James Hamer, 4,121,286, Cl. 364-200.000.
Hodges, Raymond John; and Belcher, Charles Brian, to Australian Wire Industries (Pty.) Limited. Method of preparing small samples including linishing an area of the samples. 4,120,584, Cl. 356-36.000.
Hoechst Aktiengesellschaft: *See—*
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Hoffman, Charles R., Jr., to United States of America, Air Force. Socket lug assembly for aircraft stores. 4,120,232, Cl. 89-1.50R.
Hoffmann, Kurt; and Wotruba, Gottfried, to Siemens Aktiengesellschaft. Regenerator circuit for CCD arrangements. 4,121,117, Cl. 307-221.00D.
Hoffmann-La Roche Inc.: *See—*
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Stiel, Donald Melvyn, 4,121,289, Cl. 364-552.000.
Townsend, John Melvin; and Valentine, Donald Herman, Jr., 4,120,870, Cl. 260-340.90R.
Hoffner, Joel L.; and Galanis, Tom L., to Bethlehem Steel Corporation. Linearity correction system for electro-optical gage. 4,121,291, Cl. 364-571.000.
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Galanis, Tom L.; Hoffner, Joel L.; Clymer, John C.; Hostetter, Richard S., Jr.; Jones, Duane T.; and Yerkes, Ronald W., 4,121,292, Cl. 364-571.000.
Galanis, Tom L.; Hoffner, Joel L.; Clymer, John C.; and Jones, Duane T., 4,121,294, Cl. 364-571.000.
Hofmann, Wilfried; Lueder, Guenther; Rauffer, Walter; Krueger, John; and Koopmann, Adolf, to Agfa-Gevaert Aktiengesellschaft. Portable microfilm reader. 4,120,574, Cl. 353-27.00R.
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Holland Company: *See—*
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Holtschmidt, Ulrich: *See—*
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Holtzen, Larry D. Center pivot irrigation apparatus. 4,120,454, Cl. 239-177.000.
Homma, Yuzuru, to Green Cross Corporation, The. Medicament for preventing and treating pseudomonas aeruginosa infections and method of its preparation. 4,120,950, Cl. 424-87.000.
Hon Industries Inc.: *See—*
Temple, Philip A.; Hasbrouck, Gene B.; and Howe, Stanley M., 4,120,124, Cl. 52-122.000.
Hone, George D.; Noall, Kenneth L.; and Saunders, Robert L., to Abex Corporation. Articulated closure for a passenger loading bridge. 4,120,067, Cl. 14-71.500.
Honeywell Inc.: *See—*
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Hooker Chemicals & Plastics Corp.: *See—*
Gingrich, Reyhard W., 4,120,746, Cl. 159-47.00R.
Ridgway, John E., 4,120,773, Cl. 204-252.000.
Hoover Universal, Inc.: *See—*
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Hopkins, Donald J.; Salyers, John C.; and Goranson, Paul L., to Carrier Corporation. Refuse container. 4,120,415, Cl. 220-1.00T.
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Hormann, Michael, to Hormann KG Amshausen. Combined supporting roller-friction drive arrangement for overhead single-panel doors. 4,120,072, Cl. 16-87.00R.
Horowitz, Charles, to Sloan Valve Company. Circuit breaker adapter. 4,121,066, Cl. 200-51.00R.
Horrocks, Raymond G., to Scott & Fetzer Company, The. Electrical connector. 4,120,557, Cl. 339-252.00R.
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Hosick, Thomas A. Treatments for arthritis and cast dermatitis. 4,120,976, Cl. 424-282.000.

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Howard, Robert, to Centronics Data Computer Corp. Correction device for typewriters and the like. 4,120,594, Cl. 400-697.000.

Howe, Stanley M.: *See*—
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Hoya Corporation: *See*—
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Hruda, Robert M.; and Wayland, Paul O., to Westinghouse Electric Corp. Electrolytic cell vacuum switching system. 4,121,268, Cl. 361-3.000.

Hruza, Denis E., Sr.: *See*—
Light, Kenneth K.; Sanders, James Milton; Vock, Manfred Hugo; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja Dulal; Tseng, Ching Y.; and Sprecker, Mark A., 4,120,308, Cl. 131-17.00R.

Hubbard, S. Eugene, to Kawneer Company, Inc. Double glazed wall structure. 4,120,127, Cl. 52-172.000.

Hubbert, Murray J.: *See*—
Thompson, Richard L.; Hubbert, Murray J.; and Wade, Vernon J., 4,120,479, Cl. 251-56.000.

Huber, Wolfgang, to SKF Kugellagerfabriken GmbH. Self-pressurizing radial friction bearing. 4,120,544, Cl. 308-240.000.

Hudalla, Mark G., to Minnesota Mining and Manufacturing Company. Applicator for heat-activatable tape. 4,120,718, Cl. 156-499.000.

Hudson Pulp & Paper Corp.: *See*—
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Hudspeth, William, to Polaroid Corporation. Collapsible flare baffle for folding camera. 4,121,233, Cl. 354-150.000.

Huebner, Werner P. E. Vertical flow inclined plate clarifier. 4,120,796, Cl. 210-522.000.

Huebner, Werner P. E. Cross-flow inclined plate clarifier. 4,120,797, Cl. 210-522.000.

Huelsman, Kenneth A., to Hughes Aircraft Company. Flicker free scan conversion system. 4,121,250, Cl. 358-140.000.

Huff, Joel R.: *See*—
Saari, Walfred S.; and Huff, Joel R., 4,120,971, Cl. 424-272.000.

Hufken, Kurt: *See*—
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Hughes Aircraft Company: *See*—
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Moyer, Norman E., 4,120,148, Cl. 58-85.500.

Hughes, John H., to J. H. Hughes, Inc. One operator shake splitting apparatus. 4,120,334, Cl. 144-326.00R.

Hughes, John H., to J. H. Hughes, Inc. Rotary wood waste grinder. 4,120,458, Cl. 241-186.00R.

Hull, Michael Neill: *See*—
Turillon, Pierre Paul; Hull, Michael Neill; and Nordblom, George Frederick, 4,121,024, Cl. 429-245.000.

Hulme, Roger, to Exxon Research & Engineering Co. Recovery of Lewis acid/Bronsted acid catalyst with hydrogen at elevated temperatures and pressures. 4,120,912, Cl. 260-683.470.

Hults, Harold W., to Cutler-Hammer, Inc. Snap-action overcenter switch having an apexed plunger depressible in a rockable actuator block. 4,121,072, Cl. 200-67.00A.

Hummelstedt, Leif Erik Ingmar; Nyman, Bror Goran; and Leimala, Raimo Juhani, to Outokumpu Oy. Extraction agent composition. 4,120,817, Cl. 252-364.000.

Humphrey, Richard V. Method of making fiber-reinforced plastic unitized boat hull frame. 4,120,749, Cl. 156-245.000.

Hunger, Volker: *See*—
Haase, Rainer; Hunger, Volker; and Lenz, Arnold, 4,120,938, Cl. 423-332.000.

Hunt, Frederick C. Electrodynamic force generator. 4,121,124, Cl. 310-13.000.

Hunt, Raymond L.; Lin, Ben H.; Ream, Thomas A.; Robertson, Gene D.; and Young, John H., to Magnavox Company, The. Apparatus for interfacing with plasma type display panels. 4,121,135, Cl. 315-169.00R.

Hunter, Hubert E.: *See*—
Boyles, Tonnie M.; and Hunter, Hubert E., 4,120,675, Cl. 55-431.000.

Hurley, Glen A., to Hurley's Concepts, Inc. Drapery support assembly. 4,120,474, Cl. 248-263.000.

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Hurley, Glen A., 4,120,474, Cl. 248-263.000.

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Hurst, George P., to Skega Aktiebolag. Wear liners for abrasive-material handling equipment. 4,120,605, Cl. 415-170.00R.

Hurt, Henry Wayne, to Lubbock Manufacturing Company. Implement trailer. 4,120,513, Cl. 280-423.00B.

Hussain, Anwar A., to Interx Research Corporation. Novel 2-acetoxybenzoic acid-nicotinamide complexes. 4,120,958, Cl. 424-232.000.

Husson, Jean, to S.E.R.A. Husson Societe d'Etudes et Realisations Aerodynamiques. Device for connecting exchanger tubes to perforated plates. 4,120,352, Cl. 165-173.000.

Hyatt, Gilbert P. High registration photomask method and apparatus. 4,120,583, Cl. 355-86.000.

Hyatt, Gilbert P. Computerized system for operator interaction. 4,121,284, Cl. 364-200.000.

Iceland, William F.: *See*—
Malmuth, Norman D.; Birnbaum, George; and Iceland, William F., 4,121,087, Cl. 219-121.00L.

Ichikawa, Kiyoshi: *See*—
Takamatsu, Yukio; Wakabayashi, Takashi; Noda, Hideyo; Ichikawa, Kiyoshi; Kamegai, Tsuneteru; and Ikawa, Kazuo, 4,120,516, Cl. 280-728.000.

Ichiyanagi, Toshikazu: *See*—
Sakaguchi, Keiichi; Komine, Yoshio; Ichiyanagi, Toshikazu; Shimazaki, Mamoru; and Hosoe, Kazuya, 4,120,571, Cl. 352-27.000.

ICI Americas Inc.: *See*—
Kruse, Walter M., 4,120,824, Cl. 252-447.000.

Idaho Research Foundation, Inc.: *See*—
Eder, Anton Allen, 4,120,283, Cl. 126-270.000.

Ife, Robert John: *See*—
Brown, Thomas Henry; Durant, Graham John; Ganellin, Charon Robin; and Ife, Robert John, 4,120,966, Cl. 424-263.000.
Brown, Thomas Henry; Durant, Graham John; Ganellin, Charon Robin; and Ife, Robert John, 4,120,972, Cl. 424-273.00R.

Iga, Akira; and Doi, Toshitada, to Sony Corporation. Digital to analog converter with power amplification. 4,121,205, Cl. 340-347.0DA.

Iizuka, Akio; Taguchi, Michiichi; and Kubo, Muneyuki, to Nissan Motor Company, Limited. Catalyst for conversion of engine exhaust gas. 4,120,821, Cl. 252-432.000.

Iizuka, Motohiko; Danjo, Hiroyuki; Ikeda, Kazuo; and Yoshimura, Masatoshi, to Shinagawa Shirorenga Kabushiki Kaisha; Nippon Kokan Kabushiki Kaisha; Kabushiki Kaisha Ikeda Kikai Seisakusho; and Shinagawa Roko Kabushiki Kaisha. Stamping apparatus for applying lining material to iron runners. 4,120,488, Cl. 266-281.000.

Ikawa, Kazuo: *See*—
Takamatsu, Yukio; Wakabayashi, Takashi; Noda, Hideyo; Ichikawa, Kiyoshi; Kamegai, Tsuneteru; and Ikawa, Kazuo, 4,120,516, Cl. 280-728.000.

Ikeda, Hiroshi: *See*—
Inamoto, Yoshiaki; Aigami, Koji; Ohsugi, Motoyoshi; Ikeda, Hiroshi; and Fujikura, Yoshiaki, 4,120,906, Cl. 260-648.00C.

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Iizuka, Motohiko; Danjo, Hiroyuki; Ikeda, Kazuo; and Yoshimura, Masatoshi, 4,120,488, Cl. 266-281.000.

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Ikenoue, Shinpei; and Masuda, Takao, to Fuji Photo Film Co., Ltd. Thermally developable light-sensitive material. 4,120,728, Cl. 96-114.100.

Ilich, Daniel F.: *See*—
Cotsworth, John L.; and Ilich, Daniel F., 4,120,284, Cl. 126-270.000.

Ilichenko, Andrei Yakovlevich: *See*—
Liverant, Vladimir Leibovich; Yagupolsky, Lev Moiseevich; Ilichenko, Andrei Yakovlevich; Timashpolskaya, Faina Borisovna; Fedorovskaya, Elena Alexeevna; Petrik, Lidia Ivanovna; Kalantarov, Iosif Yakubovich; Kopylova, Mira Semenovna; and Meitus, Idima Evgenievna, 4,120,855, Cl. 260-153.000.

Illinois Tool Works Inc.: *See*—
Genz, Earl James, 4,121,185, Cl. 336-110.000.

Imbro, Michael. Invalid chairs. 4,120,530, Cl. 297-337.000.

Imperial Chemical Industries Limited: *See*—
Berrie, John Sorbie; and Woolley, Graham Edward, 4,120,737, Cl. 106-109.000.
Candlin, John Paton; Wilson, Keith Collier; and Pearce, Ronald, 4,121,030, Cl. 526-119.000.
Gissane, William James Mason, 4,121,202, Cl. 340-324.00M.

Inamoto, Yoshiaki; Aigami, Koji; Ohsugi, Motoyoshi; Ikeda, Hiroshi; and Fujikura, Yoshiaki, to Kao Soap Co., Ltd. 1-Halogenotricyclo [4.3.1.$1^{4,9}$] undecane and process for the preparation thereof. 4,120,906, Cl. 260-648.00C.

Industrial Dynamics Company, Ltd.: *See*—
Calhoun, Fredrick L., 4,121,103, Cl. 250-343.000.

Industrie Pirelli S.p.A.: *See*—
Colombani, Bruno; and Pacciarini, Antonio, 4,120,714, Cl. 156-131.000.

Infern-O-Therm Corporation: *See*—
Martin, Charles K., 4,120,640, Cl. 431-353.000.

Ing. C. Olivetti & C., S.p.A.: *See*—
Roano, Domenico, 4,120,593, Cl. 400-549.000.

Ingenjorsfirman R. Ohrnell AB: *See*—
Johansson, Kurt E., 4,120,197, Cl. 73-144.000.

Inland Steel Company: *See*—
Franks, Lawrence L.; and Gomersall, David W., 4,120,997, Cl. 427-367.000.
Inooka, Masayoshi: *See*—
Morimoto, Tatsuo; Nakamura, Munekazu; Inooka, Masayoshi; and Yawata, Teizaburo, 4,120,780, Cl. 208-211.000.
Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,120,994, Cl. 427-239.000.
Inoue, Kenji: *See*—
Ogawa, Hiromichi; Inoue, Kenji; and Fujiwara, Akira, 4,121,021, Cl. 429-162.000.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Method of preparing heat-transfer members. 4,120,994, Cl. 427-239.000.
Inspiration Consolidated Copper Company: *See*—
Fountain, Gerald F.; Veloz, Jaime; and Dahlberg, Harry R., 4,120,935, Cl. 423-41.000.
Institut Francais du Petrole: *See*—
Douaud, Andre; and Rialan, Joseph, 4,120,272, Cl. 123-117.00D.
Institut Matematiki i Mekhaniki Akademii Nauk Kazakhskoi SSR: *See*—
Akushsky, Izrail Yakovlevich; Burtsev, Vladimir Mikhailovich; Duisenov, Bulat Esenovich; Pak, Ivan Timofeevich; and Zhautykov, Anurbek Orymbekovich, 4,121,298, Cl. 364-746.000.
Institut National de la Sante Et de la Recherche Medicale: *See*—
Rabischong, Pierre; and Bel, Jean-Pierre L., 4,120,297, Cl. 128-78.000.
Institut National de Recherche Chimique Appliquee Ircha: *See*—
Dick, Richard; Feuillade, Georges; Gadessaud, Robert; and Nicolas, Louis, 4,121,022, Cl. 429-204.000.
Institut National du Verre: *See*—
Galanti, Maurice R. G., 4,120,682, Cl. 65-181.000.
International Business Machines Corporation: *See*—
Ameen, Joseph G.; Elmore, Glenn V.; and Peter, Anthony E., 4,120,843, Cl. 260-33.80R.
Bishop, Robert Eugene, 4,121,089, Cl. 219-216.000.
Christian, John Hunt; and Overacker, James Leroy, 4,120,629, Cl. 425-135.000.
Cox, Allen Ronald; Hatchett, Michael Robert; and Rigbey, Leonard John, 4,120,505, Cl. 274-39.00R.
Daniels, Raymond Alex; Gibson, David Kent; Kummli, Paul; Snell, Spencer Allan; and Ulrich, Michael Henry, 4,120,578, Cl. 355-8.000.
Phipps, Peter Beverley; Sharma, Bhim Sain; and Wu, Anthony Wai, 4,120,995, Cl. 427-248.00A.
International Flavors & Fragrances Inc.: *See*—
Light, Kenneth K.; Sanders, James Milton; Vock, Manfred Hugo; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja Dulal; Tseng, Ching Y.; and Sprecker, Mark A., 4,120,308, Cl. 131-17.00R.
International Nickel Company, Inc., The: *See*—
Turillon, Pierre Paul; Hull, Michael Neill; and Nordblom, George Frederick, 4,121,024, Cl. 429-245.000.
International Shoe Machine Corporation: *See*—
Vornberger, Walter; and Vornberger, Karl F., 4,120,063, Cl. 12-12.000.
International Standard Electric Corporation: *See*—
Jessop, Anthony, 4,121,195, Cl. 340-146.1AB.
International Telephone and Telegraph Corporation: *See*—
Auerbach, Andrew B.; Thelman, John P.; and Turbak, Albin F., 4,120,836, Cl. 260-15.000.
Place, Harry, 4,121,051, Cl. 179-1.0SM.
Interx Research Corporation: *See*—
Bodor, Nicolae S., 4,120,959, Cl. 424-238.000.
Hussain, Anwar A., 4,120,958, Cl. 424-232.000.
Intraub, Julius: *See*—
Ornstein, Leonard; Williams, Hazel Elizabeth; and Intraub, Julius, 4,120,991, Cl. 427-2.000.
Irvin, Howard B.; and Sherk, Fred T., to Phillips Petroleum Company. Polyolefin reactor system. 4,121,029, Cl. 526-64.000.
Irwin, George W., to Owens-Illinois, Inc. Funnel arm operating mechanism. 4,120,683, Cl. 65-207.000.
Irwin, James Stuart; and Steel, Francis Robert, to Motorola, Inc. Adjustable antenna arrangement for a portable radio. 4,121,218, Cl. 343-702.000.
Ishida, Masamitsu: *See*—
Matsumoto, Seiji; Takahashi, Isoji; Komaki, Takao; Ishida, Masamitsu; Kozeki, Tomotaka; Horikawa, Kazuo; and Shimanuki, Kozi, 4,121,101, Cl. 250-315.00A.
Ishida, Takashi: *See*—
Minekawa, Saburo; Yonekawa, Sigeru; Tabata, Haruro; Ishida, Takashi; Tsuchida, Satoshi; and Yamada, Kiyoshi, 4,121,031, Cl. 526-173.000.
Ishihara, Tetsuo: *See*—
Harada, Yuichi; Ishihara, Tetsuo; and Takahashi, Shigeyuki, 4,121,006, Cl. 428-172.000.
Ishikawa, Youhei: *See*—
Nishikawa, Toshio; Ito, Yoji; Ishikawa, Youhei; and Tamura, Sadahiro, 4,121,181, Cl. 333-73.00R.
Ishimoto, Tasuku: *See*—
Kimura, Atsushi; and Ishimoto, Tasuku, 4,120,452, Cl. 235-381.000.
Isobe, Hiroshi; Koyanagi, Toru; and Sakuranaka, Toru, to Diesel Kiki Co., Ltd. Engine fuel injection pump governor. 4,120,275, Cl. 123-140.0MC.
Isono, Katsuo: *See*—
Morita, Kouji; and Isono, Katsuo, 4,121,254, Cl. 358-195.000.
Isoyama, Seizi: *See*—
Watanabe, Yasuo; and Isoyama, Seizi, 4,120,806, Cl. 252-62.540.
Watanabe, Yasuo; and Isoyama, Seizi, 4,120,807, Cl. 252-62.620.
Ito, Sakae: *See*—
Kobayashi, Hidehiko; Arakawa, Tatsumi; Shiga, Tetsuo; Ohmura, Kaoru; and Ito, Sakae, 4,121,007, Cl. 428-201.000.
Ito, Yoji: *See*—
Nishikawa, Toshio; Ito, Yoji; Ishikawa, Youhei; and Tamura, Sadahiro, 4,121,181, Cl. 333-73.00R.
Ito, Yoshinobu: *See*—
Iwaisako, Toshiyuki; Yamaguchi, Naomi; Yomogida, Hisao; and Ito, Yoshinobu, 4,120,943, Cl. 423-628.000.
IU Conversion Systems, Inc.: *See*—
Wright, Francis C., 4,120,791, Cl. 210-84.000.
Iverson, Harold L.; and Lemley, Robert M., to Iverson, Harold L., a part interest. Adjustable grill device. 4,120,280, Cl. 126-30.000.
Iwaisako, Toshiyuki; Yamaguchi, Naomi; Yomogida, Hisao; and Ito, Yoshinobu, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for producing pseudo-boehmite. 4,120,943, Cl. 423-628.000.
Iwamatsu, Masayuki, to Nippon Gakki Seizo Kabushiki Kaisha. Amplifier device. 4,121,169, Cl. 330-296.000.
Iwasa, Yoshio: *See*—
Toda, Yoshio; and Iwasa, Yoshio, 4,120,214, Cl. 74-860.000.
Iwasaki, Itsutoshi: *See*—
Taniguchi, Taizo; Iwasaki, Itsutoshi; Takeshige, Toshihiko; Onizuka, Koji; and Hashiguchi, Soichi, 4,120,734, Cl. 106-67.000.
Izumi, Tsutomu: *See*—
Miyauchi, Kohichiroh; Ohsumi, Atsushi; Haga, Yukio; Izumi, Tsutomu; Tsuru, Masahiro; Kunioka, Kazuo; and Sugiyama, Shunichi, 4,120,642, Cl. 432-12.000.
Izumitani, Tetsuro; and Tsutome, Michitaka, to Hoya Corporation. Fluorophosphate-base laser glasses. 4,120,814, Cl. 252-301.40P.
J. H. Hughes, Inc.: *See*—
Hughes, John H., 4,120,334, Cl. 144-326.00R.
Hughes, John H., 4,120,458, Cl. 241-186.00R.
J. I. Case Company: *See*—
Nissen, Roland N.; and Flippin, James S., 4,120,366, Cl. 172-805.000.
Jackson, Eugene D., III, to Rockwell International Corporation. Anti-vortex pintle. 4,120,152, Cl. 60-221.000.
Jackson, Robert G.: *See*—
Starks, Charles M.; Jackson, Robert G.; Porchey, David V.; and Royer, Dennis J., 4,120,881, Cl. 260-449.60R.
Jaedicke, Hagen; and Paust, Joachim, to BASF Aktiengesellschaft. Cyclic 2-methyl-2,4-dialkoxy-3-buten-1-al-acetals, their preparation and use. 4,120,868, Cl. 260-340.700.
Jager, Ernst Adolf, to Flottweg-Werk Dr. Georg Bruckmayer GmbH & Co. KG. Pressure-tight solid bowl screw centrifuge. 4,120,447, Cl. 233-7.000.
Jaggard, James F. R.: *See*—
Mueller-Tamm, Heinz; Schick, Hans; Jaggard, James F. R.; and Nickl, Johann, 4,120,823, Cl. 252-442.000.
Jagoutz, Emil; and Palme, Christl, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Radiation analysis apparatus and method utilizing multi-channel pulse peak voltage discriminator. 4,121,098, Cl. 250-273.000.
Jakob Muller, Forschungs-und Finanz AG: *See*—
Speich, Francisco, 4,120,221, Cl. 83-62.100.
James, Harry K.: *See*—
Payne, Thomas R.; James, Harry K.; and Judy, Millard M., 4,120,744, Cl. 156-653.000.
Jameson, Melvin Neil; Klicker, James Donald; Krulik, Gerald Albert; and York, James Farnsworth, to McGean Chemical Co. Catalytically active composition for electroless plating. 4,120,822, Cl. 252-441.000.
Jamieson, Geoffrey A.: *See*—
Ciko, John D.; Cramer, John J.; and Jamieson, Geoffrey A., 4,120,799, Cl. 252-8.600.
Ciko, John D.; Cramer, John J.; and Jamieson, Geoffrey A., 4,120,802, Cl. 252-8.750.
Janicke, Johann, to Ateliers des Charmilles, S.A. Wire electrode vibration damper. 4,121,080, Cl. 219-69.00W.
Janko, Mike A. Video processor providing sync stripping and reinsertion. 4,121,242, Cl. 358-4.000.
Jansons, Viktors: *See*—
Gotcher, Alan J.; Germeraad, Paul B.; and Jansons, Viktors, 4,121,001, Cl. 428-35.000.
Janssen Pharmaceutica N.V.: *See*—
Heeres, Jan, 4,120,869, Cl. 260-340.90R.
Japan Steel Works, Ltd., The: *See*—
Hasegawa, Akira, 4,120,478, Cl. 251-31.000.
Jarrett, Robert Benjamin; Pace, Wilson David; and Weber, Howard Fredrick, to Motorola, Inc. Cruise control method and apparatus. 4,121,273, Cl. 361-239.000.
Jedora, John J. Machine for cleaning a fabric workpiece. 4,120,180, Cl. 68-20.000.
Jejina, Filip, to Siemens Aktiengesellschaft. Circuit arrangement for the switching on and off of a teleprinter PBX exchange. 4,121,047, Cl. 178-3.000.
Jensen, Finn Ulrik Hansen; Nielsen, Per Drengsgaard; and Bruhn, Esben, to A/S Weston Taeppefabrik. Process and apparatus for the continuous production of a fibrous web-like pile product. 4,120,713, Cl. 156-72.000.
Jessop, Anthony, to International Standard Electric Corporation. Error detection in digital systems. 4,121,195, Cl. 340-146.1AB.
Jeter, John Doise. Pulse transmitter. 4,120,097, Cl. 33-307.000.

JGC Corporation: *See*—
Numasaki, Kouichi; Sakai, Yoshihisa; Nawa, Takehiko; Matsumoto, Zenji; and Ninomiya, Nobutaka, 4,120,644, Cl. 432-99.000.
Jirak, Thomas L.; and Mulier, Pieter M. J., to Medtronic, Inc. Cardiac pacemaker. 4,120,307, Cl. 128-419.0PT.
Joelson, Karl Evert Anders, to AB Vabyma. Device for distributing a fluid flow in fixed proportions. 4,120,234, Cl. 91-518.000.
Johansson, Kurt E., to Ingenjorsfirman R. Ohrnell AB. Device for sensing exerted load on a rope, wire, or the like. 4,120,197, Cl. 73-144.000.
Johansson, Sven Halvor. Supplying motive fluid to below ground tool drive from a pressurized bore hole. 4,120,368, Cl. 175-71.000.
John Zink Company: *See*—
Reed, Robert D., 4,120,637, Cl. 431-5.000.
Johns-Manville Corporation: *See*—
Hahn, William Peter; Hite, Edward Lee; Shisler, Donald Eugene; and Simmers, Charles Donald, 4,120,676, Cl. 65-4.00R.
Johnson, Alfred L.: *See*—
Hamil, Roy A.; and Johnson, Alfred L., 4,121,175, Cl. 331-94.50D.
Johnson, Bobby L. Portable battery cart. 4,120,411, Cl. 214-38.0BA.
Johnson, Carl N.: *See*—
Bileski, Thomas; Crawford, Joe W.; Blanton, Bobby D.; Johnson, Carl N.; Garcia, Felix; Orcutt, John W.; Shepherd, Glen C.; and Oursler, James A., 4,121,073, Cl. 200-83.00P.
Johnson & Johnson: *See*—
Smyth, Milagros B.; and Lee-You, James, 4,120,729, Cl. 106-35.000.
Johnson, Richard N.; and Schneider, Marvin J., to United States of America, Army. Data base update scheme. 4,121,196, Cl. 340-146.30P.
Johnston, Dean Edward: *See*—
Bhateja, Chander Prakash; Alling, Richard Lassen; and Johnston, Dean Edward, 4,120,542, Cl. 308-219.000.
Johnston, Robert F.; and Wells, Thomas R., to Bell & Howell Company. Microfiche reader. 4,120,573, Cl. 353-27.00A.
Johnston, William C., to Kysor Industrial Corporation. Air defrost display case. 4,120,174, Cl. 62-256.000.
Joly, Pierre: *See*—
Habermann, Helmut; Brunet, Maurice; and Joly, Pierre, 4,121,143, Cl. 318-629.000.
Jones, Duane T.: *See*—
Galanis, Tom L.; Hoffner, Joel L.; Clymer, John C.; Hostetter, Richard S., Jr.; Jones, Duane T.; and Yerkes, Ronald W., 4,121,292, Cl. 364-571.000.
Galanis, Tom L.; Hoffner, Joel L.; Clymer, John C.; and Jones, Duane T., 4,121,294, Cl. 364-571.000.
Jones, Francis L., to Towmotor Corporation. Switch for indicating brush wear. 4,121,207, Cl. 340-648.000.
Jones, Garland, Jr. Pulling hook apparatus. 4,120,189, Cl. 72-457.000.
Jones, John B.; and Upton, Robert W., to Four Star, Inc. Spear-type tractor-attached hay bale pickup device. 4,120,405, Cl. 214-1.0HH.
Jones, Kenneth Malcolm. Circumlens camera illumination system. 4,121,232, Cl. 354-126.000.
Jones, Ladell: *See*—
Smith, William L.; Kelyman, Jacqueline S.; and Jones, Ladell, 4,120,804, Cl. 252-47.500.
Jones, Melvin L., to Overhead Door Corporation. Motor control circuit. 4,121,140, Cl. 318-221.00R.
Jonville, Pierre: *See*—
Breda, Frederic: and Jonville, Pierre, 4,120,763, Cl. 204-73.00R.
Joseph, Joseph Peter; and Bernstein, Seymour, to American Cyanamid Company. 2,2',2''-[s-Phenenyltris(carbonylimino)]tris-2-deoxy-D-glucopyranose and salts thereof. 4,120,954, Cl. 424-180.000.
Joseph Lucas (Batteries) Limited: *See*—
McEwan, Keith John Bruce, 4,120,087, Cl. 29-623.200.
Jourdan, Jerry W., to ACF Industries, Incorporated. Dampening means for swing check valve. 4,120,318, Cl. 137-527.400.
Judy, Millard M.: *See*—
Payne, Thomas R.; James, Harry K.; and Judy, Millard M., 4,120,744, Cl. 156-653.000.
Jung, Hans: *See*—
Kovacs, Jenoe; Jung, Hans; Marx, Matthias; and Spoor, Herbert, 4,121,266, Cl. 528-288.000.
Junge, Karl-Wilhelm: *See*—
Hanisch, Gerhard; Fischer, Gunther; Gahler, Seigfried; Franz, Udo; Kuschel, Karl; Mayer, Roland; Bach, Gunther; and Junge, Karl-Wilhelm, 4,120,726, Cl. 96-107.000.
Jusko, Stephen C.; and Tillotson, Thomas C., to E-Systems, Inc. Voice processor. 4,121,058, Cl. 179-15.55T.
Justamante, Juan, to Suave Shoe Corporation. Mold and method for injection molding a sole onto a shoe upper. 4,120,477, Cl. 249-109.000.
Jutte, Hans: *See*—
Stuckmann, Dieter; and Jutte, Hans, 4,120,165, Cl. 405-145.000.
Kaarlela, William T.: *See*—
Weltman, Henry J.; Carroll, Mark T.; Halkias, John E.; Kaarlela, William T.; and Reynolds, Jack D., 4,121,157, Cl. 324-216.000.
Kabushiki Kaisha Banzai: *See*—
Mima, Yoshitada; Kubushiro, Naoaki; and Kojima, Koji, 4,120,589, Cl. 356-121.000.
Kabushiki Kaisha Ikeda Kikai Seisakusho: *See*—
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Kabushiki Kaisha Ohara Kogaku Garasu Seizosho: *See*—
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Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Shinoda, Akibumi; and Kido, Noriyoshi, 4,120,375, Cl. 180-89.140.
Kaczmarek, Philip Michael. Rally wheel cleaning implement. 4,120,068, Cl. 15-160.000.
Kadija, Igor V., to Olin Corporation. Cell for electrolyzing aqueous solutions using a porous anode separator. 4,120,772, Cl. 204-252.000.
Kadin, Saul B.: *See*—
Althuis, Thomas H.; Czuba, Leonard J.; Hess, Hans-Jurgen E.; and Kadin, Saul B., 4,120,962, Cl. 424-251.000.
Kagoura, Tetsuro, to Yoshida Kogyo K.K. Latch assembly. 4,120,525, Cl. 292-336.300.
Kaimins, Laimons: *See*—
Keem, Phillip William; Kaimins, Laimons; and Graham, James, 4,120,615, Cl. 417-360.000.
Kaji, Masao: *See*—
Asami, Hiroshi; and Kaji, Masao, 4,120,759, Cl. 204-14.00R.
Kalalian, John R.: *See*—
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Kalantarov, Iosif Yakubovich: *See*—
Liverant, Vladimir Leibovich; Yagupolsky, Lev Moiseevich; Ilichenko, Andrei Yakovlevich; Timashpolskaya, Faina Borisovna; Fedorovskaya, Elena Alexeevna; Petrik, Lidia Ivanovna; Kalantarov, Iosif Yakubovich; Kopylova, Mira Semenovna; and Meitus, Idima Evgenievna, 4,120,855, Cl. 260-153.000.
Kalfoglou, George, to Texaco Inc. Surfactant oil recovery method for use in high temperature formations containing water having high salinity and hardness. 4,120,358, Cl. 166-275.000.
Kaltenbach & Voigt GmbH & Co.: *See*—
Lohn, Gerd, 4,120,623, Cl. 418-173.000.
Kamath, Venkatesh: *See*—
Light, Kenneth K.; Sanders, James Milton; Vock, Manfred Hugo; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja Dulal; Tseng, Ching Y.; and Sprecker, Mark A., 4,120,308, Cl. 131-17.00R.
Kamegai, Tsuneteru: *See*—
Takamatsu, Yukio; Wakabayashi, Takashi; Noda, Hideyo; Ichikawa, Kiyoshi; Kamegai, Tsuneteru; and Ikawa, Kazuo, 4,120,516, Cl. 280-728.000.
Kamiyama, Setsuo; Kaneko, Katsumi; Nagashima, Yukio; Furukawa, Hiroshi; and Wada, Shozo, to Toa Nenryo Kogyo Kabushiki Kaisha. Process for the conversion of C_8 aromatic hydrocarbons. 4,120,908, Cl. 260-668.00A.
Kamm, Kurt: *See*—
Gehring, Karl; and Kamm, Kurt, 4,120,408, Cl. 214-10.000.
Kampe, Wolfgang; Senn, Martin; Thiel, Max; Bartsch, Wolfgang; and Dietmann, Karl, to Boehringer Mannheim GmbH. Certain pyrido[3,4-b]indole-1-ones. 4,120,963, Cl. 424-256.000.
Kan, Peter T.: *See*—
Woerner, Frank Peter; Kan, Peter T.; and Falkenstein, Georg, 4,120,884, Cl. 260-453.0SP.
Kanamori, Katsuo; Sakurai, Nobuo; and Arai, Ryozo, to Mitsuboshi Belting Limited. Rubber screens for vibratory screening apparatus. 4,120,785, Cl. 209-401.000.
Kaneko, Katsumi: *See*—
Kamiyama, Setsuo; Kaneko, Katsumi; Nagashima, Yukio; Furukawa, Hiroshi; and Wada, Shozo, 4,120,908, Cl. 260-668.00A.
Kao Soap Co., Ltd.: *See*—
Inamoto, Yoshiaki; Aigami, Koji; Ohsugi, Motoyoshi; Ikeda, Hiroshi; and Fujikura, Yoshiaki, 4,120,906, Cl. 260-648.00C.
Yagi, Kouichi; and Nakagawa, Yunosuke, 4,120,811, Cl. 252-186.000.
Kaplan, Irving Leonard, to Carl Krasny & Associates, Inc. Bundle compactor. 4,120,243, Cl. 100-212.000.
Kappler, Frank Robert; Killian, Roma Jean; and Cramer, John Joseph, to BASF Wyandotte Corporation. Laundering process for dual bleaching stained fabrics. 4,120,650, Cl. 8-109.000.
Karku-Titan Oy: *See*—
Lasmo, Raimo Juhani, 4,120,104, Cl. 36-117.000.
Karl, Alva A.: *See*—
Oloff, Clarence M.; Karl, Alva A.; Wolff, Walter M.; Halbrook, Lloyd W.; Brown, Ray D.; and Dickey, Raymond G., 4,120,266, Cl. 119-103.000.
Karll, Robert E.: *See*—
Valcho, Joseph J.; and Karll, Robert E., 4,120,800, Cl. 252-8.55D.
Karp, Edward C.; and De Croix, Charles Emile, to Sanitary Scale Company. Label printer. 4,120,245, Cl. 101-288.000.
Karpati, Egon: *See*—
Clauder, Otto; Kokosi, Jozsef; Szporny, Laszlo; and Karpati, Egon, 4,120,858, Cl. 260-293.550.
Kasprzyk, Martin Richard: *See*—
Boos, Charles John; Hausler, Elwood Benjamin; Hirsch, James Arthur; Kasprzyk, Martin Richard; and Smith, Elmer Gene, 4,120,827, Cl. 252-512.000.
Katagiri, Shinjiro: *See*—
Kubozoe, Morioki; Minamikawa, Yoshihisa; and Katagiri, Shinjiro, 4,121,100, Cl. 250-311.000.
Kato, Kazuhisa: *See*—
Fujita, Hiroshi; and Kato, Kazuhisa, 4,121,046, Cl. 174-141.00R.
Katow, Keigo: *See*—
Ando, Masahisa; Katow, Keigo; and Yamazaki, Masami, 4,120,480, Cl. 251-61.500.
Katto, Hisao, to Hitachi, Ltd. Semiconductor device having a discharge-formed insulating film. 4,121,240, Cl. 357-52.000.
Kawamoto, Tamio, to Nissan Motor Company, Limited. Parking brake

mechanism for motor vehicle equipped with automatic transmission. 4,120,383, Cl. 188-31.000.

Kawano, Toshihiro: *See—*
Chinone, Naoki; Kawano, Toshihiro; and Nakajima, Hisao, 4,121,179, Cl. 331-94.50H.

Kawashima, Haruro: *See—*
Soma, Akiro; Kawashima, Haruro; Yamauchi, Makoto; and Tanaka, Shoji, 4,120,337, Cl. 152-353.00R.

Kawasumi, Shohachi: *See—*
Nakaguchi, Kohei; Kawasumi, Shohachi; Hirooka, Masaaki; Yabuuchi, Hiroshi; and Takao, Hiroyoshi, 4,121,032, Cl. 526-197.000.

Kawneer Company, Inc.: *See—*
Hubbard, S. Eugene, 4,120,127, Cl. 52-172.000.

Kaye, Peter D., to Bell Industries. Saw chain grinder. 4,120,215, Cl. 76-25.00A.

Kazakov, Sergei Sergeevich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Stupak, Leonid Mikhailovich; Baglai, Viktor Mikhailovich; Bogachenko, Alexei Georgievich; Kazakov, Sergei Sergeevich; and Tsyklenko, Anatoly Konstantinovich, 4,120,695, Cl. 75-10.00C.

Keating, Charles M., to United States of America, Interior. Alternating current potential measuring device. 4,121,154, Cl. 324-126.000.

Keem, Phillip William; Kaimins, Laimons; and Graham, James, to Allware Agencies Limited. Box fans. 4,120,615, Cl. 417-360.000.

Keio Gikea Kogyo Kabushiki Kaisha: *See—*
Ota, Kyozo, 4,120,229, Cl. 84-454.000.

Keller, Charles R. Bow sight. 4,120,096, Cl. 33-265.000.

Keller, Heinrich, to Maschinenfabrik Hennecke GmbH. Device for the continuous production of foam blocks of rectangular cross-section. 4,120,626, Cl. 425-89.000.

Kelley, Fred William, Jr., to General Electric Company. Gain compensation for power factor in line current regulating systems involving reactive power. 4,121,150, Cl. 323-102.000.

Kelyman, Jacqueline S.: *See—*
Smith, William L.; Kelyman, Jacqueline S.; and Jones, Ladell, 4,120,804, Cl. 252-47.500.

Kendrick, John W. Metal roofing shingle and holding strip therefor. 4,120,132, Cl. 52-478.000.

Kenigson, Robert H. Heel pad with radial ribs. 4,120,102, Cl. 36-71.000.

Kennedy, Alvin B., Jr.; Shirey, Lawrence E.; Sharp, Harper Eugene; Trowbridge, Lawrence E.; and Magee, Robert L., to Kennedy, Alvin B., Jr. Method for acoustical cleaning. 4,120,699, Cl. 134-1.000.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See—*
Forster, Siegfried; Quell, Peter; and Sack, Berthold, 4,120,750, Cl. 176-60.000.

Kerr, Andrew Guy; and Morley, Robert Arthur, to Ferranti Limited. Indication means for indicating suitable conditions for the transfer of loads between two stations movable relative to each other in a vertical plane. 4,121,293, Cl. 364-463.000.

Kesling, Peter C. Orthodontic band with identification and method of making the identification. 4,120,090, Cl. 32-14.00A.

Kessler, Manfred, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Apparatus for the polarographic measurement of oxygen. 4,120,770, Cl. 204-195.00R.

Ketley, Arthur Donald; Hein, Paul Richard; and Yang, Michael Wen-Chien, to W. R. Grace & Co. Radiation curable compositions for coating and imaging processes and method of use. 4,120,721, Cl. 96-36.300.

Kido, Noriyoshi: *See—*
Shinoda, Akibumi; and Kido, Noriyoshi, 4,120,375, Cl. 180-89.140.

Kiernan, Thomas H.: *See—*
Dunham, Charles L.; and Kiernan, Thomas H., 4,120,311, Cl. 134-6.000.

Killian, Roma Jean: *See—*
Kappler, Frank Robert; Killian, Roma Jean; and Cramer, John Joseph, 4,120,650, Cl. 8-109.000.

Kilo Corporation: *See—*
Wilson, Stephen S., 4,121,102, Cl. 250-341.000.

Kimball International, Inc.: *See—*
Dietrich, Ralph Nowack; and Robinson, John William, 4,120,225, Cl. 84-1.030.

Kimpel, Francis Alfred, to Borg-Warner Corporation. Head pressure control system for refrigeration apparatus. 4,120,173, Cl. 62-181.000.

Kimura, Atsushi; and Ishimoto, Tasuku, to Matsushita Electric Industrial Co., Ltd. Automatic vending system. 4,120,452, Cl. 235-381.000.

Kimura, Kazunori: *See—*
Ogawa, Takashi; and Kimura, Kazunori, 4,121,197, Cl. 340-166.00R.

Kimura, Takeo; and Tomita, Hitoshi, to Diesel Kiki Co., Ltd. Fuel injection valve with vortex chamber occupying auxiliary valve. 4,120,456, Cl. 239-464.000.

Kindig, James K.; and Turner, Ronald L., to Hazen Research, Inc. Process for improving coal. 4,120,665, Cl. 44-1.00R.

King, Arthur Shelley. Method and apparatus for producing foam. 4,120,765, Cl. 204-149.000.

King, James E.: *See—*
Francel, Josef; King, James E.; and Woulbroun, John M., 4,120,678, Cl. 65-32.000.

King, Raymond W.: *See—*
DePalma, Vito A.; and King, Raymond W., 4,120,585, Cl. 356-71.000.

Kingsley, Patrick John: *See—*
Orr, Thomas Samuel Campbell; and Kingsley, Patrick John, 4,120,975, Cl. 424-283.000.

Kirkpatrick, William R.: *See—*
Doremus, John A.; and Kirkpatrick, William R., 4,121,088, Cl. 219-201.000.

Kirkwood, Philip R.; and Clark, Allan, to British Steel Corporation. Welding, a steel suitable for use therein. 4,120,440, Cl. 228-231.000.

Kishi, Yoshio; and Nagami, Masaru, to Sony Corporation. Method for recording information signal and control signal. 4,121,264, Cl. 360-55.000.

Kitagawa Iron Works Co., Ltd.: *See—*
Shiraki, Hisashi, 4,120,163, Cl. 405-264.000.

Kitchen, Alonzo G.: *See—*
Fodor, Lawrence M.; and Kitchen, Alonzo G., 4,120,915, Cl. 260-880.00B.

Kitchen, John P.; and Mandusky, Jack C., to Hoover Universal, Inc. Low profile box spring assembly. 4,120,058, Cl. 5-247.000.

Kitzing, Rainer: *See—*
Smith, Norman Alfred; and Kitzing, Rainer, 4,120,898, Cl. 260-561.00S.

Klaus, Franz. Permanent magnetic centrifugal pump. 4,120,618, Cl. 417-420.000.

Klein, Schanzlin & Becker Aktiengesellschaft: *See—*
Dernedde, Robert, 4,120,175, Cl. 64-15.00B.
Reiss, Karl, 4,120,606, Cl. 415-199.100.

Kleinberg, Marvin H.: *See—*
Richards, Chester L., Jr., 4,120,569, Cl. 350-3.680.

Kleine, Charles A.; and Middleton, Verne L., to Olin Corporation. Heat exchange panel with improved header. 4,120,351, Cl. 165-170.000.

Kleinschmidt, David Charles: *See—*
Sarge, Henry David, III; and Kleinschmidt, David Charles, 4,120,747, Cl. 162-117.000.

Klepper-Werke Kommanditgesellschaft: *See—*
Stoeberl, Helmut, 4,120,632, Cl. 425-405.00R.

Klicker, James Donald: *See—*
Jameson, Melvin Neil; Klicker, James Donald; Krulik, Gerald Albert; and York, James Farnsworth, 4,120,822, Cl. 252-441.000.

Klimas, Mary G.: *See—*
Swindells, Frank E.; and Klimas, Mary G., 4,120,818, Cl. 116-114.00V.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Krause, Walter; Bober, Peter; and Haas, Eckhard, 4,120,273, Cl. 123-122.00G.
Nieden, Achim zur, 4,120,673, Cl. 55-205.000.

Klockner-Werke AG: *See—*
Geck, Gunther; and Langhammer, Jurgen, 4,120,696, Cl. 75-13.000.
Togel, Kurt; Warnke, Hans; and Westerfeld, Horst, 4,120,218, Cl. 81-57.380.

Kloker, Werner; Bovender, Franz; Gromping, Franz; Goerden, Leonhard; and Niesel, Harald, to Bayer Aktiengesellschaft. Process for manufacturing foamed materials involving contacting a thin unbroken film of liquid resin with a gaseous blowing agent under pressure. 4,120,923, Cl. 264-45.300.

Klostermann, Frits Theodoor: *See—*
Schampers, Paulus Philippus Maria; Carasso, Marino Giuseppe; and Klostermann, Frits Theodoor, 4,121,255, Cl. 358-223.000.

Knapp, Randy O., to Champion Spark Plug Company. Lead-free glaze for alumina bodies. 4,120,733, Cl. 106-48.000.

Knepper, Jay C.; and Grossman, Eugene L., to Standard Oil Company (Indiana). Method for providing fluid communication for in situ shale retort. 4,120,355, Cl. 166-259.000.

Knopp, Hans: *See—*
Martin, Wolfgang; Bauer, Wolfgang; Herion, Dieter; Linge, Hermann; and Knopp, Hans, 4,120,078, Cl. 28-252.000.

Knorr-Bremse GmbH: *See—*
Roider, Willibald, 4,120,385, Cl. 188-181.00R.

Knudson, Gary A. Structural cap and composite structure for buildings and the like. 4,120,123, Cl. 52-86.000.

Kobayashi, Hidehiko; Arakawa, Tatsumi; Shiga, Tetsuo; Ohmura, Kaoru; and Ito, Sakae, to Asahi Kasei Kogyo Kabushiki Kaisha. Printed circuit board made by dispersion imaging. 4,121,007, Cl. 428-201.000.

Koch, Friedhelm: *See—*
Merget, Norbert; and Koch, Friedhelm, 4,120,980, Cl. 426-69.000.

Kocherginsky, Meer Danilovich; Penkova, Lidia Fedorovna; and Naumenko, Viktor Arsenievich. Positive electrode for air-depolarized alkaline primary cell with thickened electrolyte. 4,121,018, Cl. 429-27.000.

Koci, Zdenek: *See—*
Agarwal, Suresh C.; and Koci, Zdenek, 4,120,648, Cl. 8-85.00R.

Kohashi, Akira: *See—*
Ohmura, Hiroshi; and Kohashi, Akira, 4,121,230, Cl. 354-21.000.

Kohl, Robert F.: *See—*
Heian, Glenn A.; and Kohl, Robert F., 4,120,645, Cl. 432-106.000.

Kojima, Koji: *See—*
Mima, Yoshitada; Kubushiro, Naoaki; and Kojima, Koji, 4,120,589, Cl. 356-121.000.

Kokosi, Jozsef: *See—*
Clauder, Otto; Kokosi, Jozsef; Szporny, Laszlo; and Karpati, Egon, 4,120,858, Cl. 260-293.550.

Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
Nakagome, Yukio; Teramura, Hiroichi; Yamazaki, Yasuhiro; and Wakahara, Yasushi, 4,121,258, Cl. 358-260.000.

Komaki, Takao: *See—*
Matsumoto, Seiji; Takahashi, Isoji; Komaki, Takao; Ishida, Masamitsu; Kozeki, Tomotaka; Horikawa, Kazuo; and Shimanuki, Kozi, 4,121,101, Cl. 250-315.00A.

Komine, Yoshio: *See—*
Sakaguchi, Keiichi; Komine, Yoshio; Ichiyanagi, Toshikazu; Shimazaki, Mamoru; and Hosoe, Kazuya, 4,120,571, Cl. 352-27.000.

Komorita, Fujio; and Nakahara, Muneo, to Kabushiki Kaisha Ohara Kogaku Garasu Seizosho. Optical glass. 4,120,732, Cl. 106-47.00Q.

Kondo, Shinichi: *See—*
Umezawa, Hamao; and Kondo, Shinichi, 4,120,955, Cl. 424-180.000.

Konig, Johann: *See—*
Kurvers, Kurt; and Konig, Johann, 4,120,613, Cl. 417-53.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Watanabe, Koji; Ohta, Mitsunori; and Tomono, Makoto, 4,120,577, Cl. 355-4.000.

Koopmann, Adolf: *See—*
Hofmann, Wilfried; Lueder, Guenther; Rauffer, Walter; Krueger, John; and Koopmann, Adolf, 4,120,574, Cl. 353-27.00R.

Kopylova, Mira Semenovna: *See—*
Liverant, Vladimir Leibovich; Yagupolsky, Lev Moiseevich; Ilichenko, Andrei Yakovlevich; Timashpolskaya, Faina Borisovna; Fedorovskaya, Elena Alexeevna; Petrik, Lidia Ivanovna; Kalantarov, Iosif Yakubovich; Kopylova, Mira Semenovna; and Meitus, Idima Evgenievna, 4,120,855, Cl. 260-153.000.

Kotyuk, Bernard, to Primary Design Group, Inc. Pill package. 4,120,400, Cl. 206-528.000.

Kovacs, Jenoe; Jung, Hans; Marx, Matthias; and Spoor, Herbert, to BASF Aktiengesellschaft. Polyamide-imide precondensates. 4,121,266, Cl. 528-288.000.

Kovatch, George N.; and Rosey, Richard, to Westinghouse Electric Corp. Electrical switchboard apparatus with center fed vertical riser bus. 4,121,276, Cl. 361-342.000.

Koyanagi, Toru: *See—*
Isobe, Hiroshi; Koyanagi, Toru; and Sakuranaka, Toru, 4,120,275, Cl. 123-140.0MC.

Kozeki, Tomotaka: *See—*
Matsumoto, Seiji; Takahashi, Isoji; Komaki, Takao; Ishida, Masamitsu; Kozeki, Tomotaka; Horikawa, Kazuo; and Shimanuki, Kozi, 4,121,101, Cl. 250-315.00A.

Kraftwerk Union Aktiengesellschaft: *See—*
Bezold, Helmut, 4,120,751, Cl. 176-78.000.

Krause, Walter; Bober, Peter; and Haas, Eckhard, to Klockner-Humboldt-Deutz Aktiengesellschaft. Starting aid for internal combustion engines. 4,120,273, Cl. 123-122.00G.

Krauss-Maffei Austria Gesellschaft m.b.H.: *See—*
Bacher, Helmuth, 4,120,460, Cl. 241-278.00R.

Krechel, Joseph L.; and Purvis, Michael J., to Control Devices, Incorporated. Manifold assembly for compressed air storage tank or the like. 4,120,319, Cl. 137-583.000.

Krieg & Zivy Industries: *See—*
Godtschalck, Lucien Joseph, 4,120,551, Cl. 312-330.00R.

Kriegbaum, Ernst: *See—*
Ripphahn, Johannes; and Kriegbaum, Ernst, 4,120,205, Cl. 73-425.600.

Krishnamurthy, Varahur Ramaswamy, to RCA Corporation. Cathode-ray tube with double tension band. 4,121,257, Cl. 358-246.000.

Krivanek, Charles S., III. Low pressure gas regulator. 4,120,331, Cl. 141-66.000.

Kriz, Vladimir: *See—*
Bezstarosti, Ladislav; Lzicar, Josef; Lanta, Jiri; and Kriz, Vladimir, 4,120,326, Cl. 139-55.100.

Krogstad, Reuben S.: *See—*
Vali, Victor; Shorthill, Richard W.; Goldstein, Raymond; and Krogstad, Reuben S., 4,120,587, Cl. 356-106.0LR.

Krol, Johannes Wilhelmus Antonius; Lersmacher, Bernhard; and Seifert, Horst, to U.S. Philips Corporation. Method of manufacturing grid electrodes for electron tubes. 4,120,080, Cl. 29-25.180.

Krueger, John: *See—*
Hofmann, Wilfried; Lueder, Guenther; Rauffer, Walter; Krueger, John; and Koopmann, Adolf, 4,120,574, Cl. 353-27.00R.

Krulik, Gerald Albert: *See—*
Jameson, Melvin Neil; Klicker, James Donald; Krulik, Gerald Albert; and York, James Farnsworth, 4,120,822, Cl. 252-441.000.

Kruse, Walter M., to ICI Americas Inc. Tetravalent manganese-carbon oxidation catalysts and methods of their preparation. 4,120,824, Cl. 252-447.000.

Kubicek, Donald H., to Phillips Petroleum Company. Preparation of carbonyl sulfide and production of methyl mercaptan therefrom. 4,120,944, Cl. 423-416.000.

Kubinak, Ronald A.: *See—*
Cowe, Alan B.; Kubinak, Ronald A.; Pick, George G.; Flanagan, Richard M.; and Szabo, Francis S., 4,121,228, Cl. 354-7.000.

Kubo, Muneyuki: *See—*
Iizuka, Akio; Taguchi, Michiichi; and Kubo, Muneyuki, 4,120,821, Cl. 252-432.000.

Kubo, Sueki; Watanabe, Toshiro; Fujita, Masayuki; Matsuno, Tadahiko; and Morita, Akira, to Kurosaki Refractories Co., Ltd. Apparatus for applying refractory material onto the inner surface of a furnace. 4,120,260, Cl. 118-317.000.

Kubozoe, Morioki; Minamikawa, Yoshihisa; and Katagiri, Shinjiro, to Hitachi, Ltd. Electron microscope. 4,121,100, Cl. 250-311.000.

Kubushiro, Naoaki: *See—*
Mima, Yoshitada; Kubushiro, Naoaki; and Kojima, Koji, 4,120,589, Cl. 356-121.000.

Kuenzli, Albert, to Sulzer Brothers Limited. Water-jet electrode steam generator. 4,121,090, Cl. 219-284.000.

Kugele, Thomas G., to Cincinnati Milacron Chemicals, Inc. Sulfide containing tin stabilizers. 4,120,845, Cl. 260-45.75S.

Kuhl, Karl-Heinz; Muranka, Eberhard; Schulz, Bernhard; and Tielens, Asmund, to TRW Inc. Electrical resistor and method of making same. 4,121,189, Cl. 338-226.000.

Kuhn, Leo A. Track eliminator apparatus. 4,120,365, Cl. 172-488.000.

Kuhnert, Gottfried, to Universal Maschinenfabrik Dr. Rudolf Schieber KG. Knitting machine. 4,120,178, Cl. 66-63.000.

Kummli, Paul: *See—*
Daniels, Raymond Alex; Gibson, David Kent; Kummli, Paul; Snell, Spencer Allan; and Ulrich, Michael Henry, 4,120,578, Cl. 355-8.000.

Kuna, Wayne A.: *See—*
Terzian, Rouben T.; Morrison, Howard J.; Schoenfield, Palmer J.; and Kuna, Wayne A., 4,120,117, Cl. 46-130.000.

Kunioka, Kazuo: *See—*
Miyauchi, Kohichiroh; Ohsumi, Atsushi; Haga, Yukio; Izumi, Tsutomu; Tsuru, Masahiro; Kunioka, Kazuo; and Sugiyama, Shunichi, 4,120,642, Cl. 432-12.000.

Kunkle, Timothy Edward, to Rockwell International Corporation. Valve-actuator coupling. 4,120,596, Cl. 403-14.000.

Kurata, Noboru: *See—*
Takano, Teruhisa; Kurata, Noboru; Kusunoki, Shigeru; and Yoshimura, Hirofumi, 4,121,078, Cl. 219-10.55F.

Kurosaki Refractories Co., Ltd.: *See—*
Kubo, Sueki; Watanabe, Toshiro; Fujita, Masayuki; Matsuno, Tadahiko; and Morita, Akira, 4,120,260, Cl. 118-317.000.

Kurvers, Kurt; and Konig, Johann, to Accumulatorenfabrik Sonnenschein GmbH. Pump for molten lead, particularly injection pump used in the manufacture of storage battery plates. 4,120,613, Cl. 417-53.000.

Kuschel, Karl: *See—*
Hanisch, Gerhard; Fischer, Gunther; Gahler, Seigfried; Franz, Udo; Kuschel, Karl; Mayer, Roland; Bach, Gunther; and Junge, Karl-Wilhelm, 4,120,726, Cl. 96-107.000.

Kushibe, Seijiro: *See—*
Fujita, Susumu; Kushibe, Seijiro; and Shimizu, Hiroshi, 4,121,235, Cl. 354-234.000.

Kusunoki, Shigeru: *See—*
Takano, Teruhisa; Kurata, Noboru; Kusunoki, Shigeru; and Yoshimura, Hirofumi, 4,121,078, Cl. 219-10.55F.

Kuznetsova, Nadezhda Nikolaevna; Samsonov, Georgy Vasilievich; Papukova, Klavdia Pavlovna; Bilibina, Galina Vladimirovna; Shataeva, Larisa Konstantinovna; Selezneva, Aida Alexandrovna; Kuznetsova, Nina Petrovna; Vitols, Oyar Ansovich; Shtrausa, Anite Ansovna; Gudkin, Lev Romanovich; Mishaeva, Rimma Nikodimovna; and Rozhetskaya, Karina Moiseevna. Process for producing carboxyl cationites. 4,120,831, Cl. 521-38.000.

Kuznetsova, Nina Petrovna: *See—*
Kuznetsova, Nadezhda Nikolaevna; Samsonov, Georgy Vasilievich; Papukova, Klavdia Pavlovna; Bilibina, Galina Vladimirovna; Shataeva, Larisa Konstantinovna; Selezneva, Aida Alexandrovna; Kuznetsova, Nina Petrovna; Vitols, Oyar Ansovich; Shtrausa, Anite Ansovna; Gudkin, Lev Romanovich; Mishaeva, Rimma Nikodimovna; and Rozhetskaya, Karina Moiseevna, 4,120,831, Cl. 521-38.000.

Kysor Industrial Corporation: *See—*
Johnston, William C., 4,120,174, Cl. 62-256.000.

L. Schuler GmbH: *See—*
Schneider, Franz; Braitinger, Helmut; and Schumann, Burkhard, 4,120,185, Cl. 72-24.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
Prost, Roger, 4,120,421, Cl. 220-423.000.

Lampert, Ernst, to Siemens Aktiengesellschaft. Method for the synchronization of a transmission path. 4,121,159, Cl. 325-65.000.

Lamy, Jacques Edouard, to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C.G. Doris". Apparatus for laying a pipeline in a body of water. 4,120,168, Cl. 405-170.000.

Lane, Robert E., Jr.: *See—*
Coker, William P.; and Lane, Robert E., Jr., 4,120,877, Cl. 260-348.230.

Lanese, Philip M., to Belco Pollution Control Corporation. Rapper assembly for electrostatic precipitators. 4,120,672, Cl. 55-112.000.

Lang, Hans Friedrich, to Gustav Weyland KG. Sheet stacking apparatus. 4,120,491, Cl. 271-64.000.

Lange, Steven R. Hollow core synthetic fireplace log and method and apparatus for producing same. 4,120,666, Cl. 44-10.00R.

Langecker, Erhard. Blow mold for the production of bellows made of a highly elastic plastic. 4,120,635, Cl. 425-535.000.

Langhammer, Jurgen: *See—*
Geck, Gunther; and Langhammer, Jurgen, 4,120,696, Cl. 75-13.000.

Lanier Business Products, Inc.: *See—*
Bohnhoff, Alan Earl, 4,121,060, Cl. 179-100.1DR.

Lannert, Kent P.: *See—*
Crutchfield, Marvin M.; and Lannert, Kent P., 4,120,874, Cl. 260-345.80R.

Lanta, Jiri: *See—*
Bezstarosti, Ladislav; Lzicar, Josef; Lanta, Jiri; and Kriz, Vladimir, 4,120,326, Cl. 139-55.100.

Larkin, Artemas M.: *See—*
Sivachenko, Eugene W.; Broacha, Firoze H.; and Larkin, Artemas M., 4,120,065, Cl. 14-6.000.

Lasky, Jerome B.; and Moran, Paul R., to United States of America, Energy. Thermoluminescent phosphor. 4,121,010, Cl. 428-403.000.

Lasmo, Raimo Juhani, to Karku-Titan Oy. Shoe for cross-country skiing. 4,120,104, Cl. 36-117.000.

LaSpisa, Ronald J.; and Giles, Richard F., to Phillips Petroleum Company. Automatic control of extrusion rate. 4,120,630, Cl. 425-142.000.

Lauer, George E.: *See—*
Stephanos, Stephen P., 4,120,403, Cl. 209-564.000.

Laurin, Bernard L.; Rotenberg, Don H.; and Crandon, Harry D., to American Optical Corporation. Abrasion-resistant optical element. 4,120,992, Cl. 427-164.000.

Lauton, Alain; and Berendt, Hans-Ulrich, to Ciba-Geigy Corporation. Process for the dyeing of wool-containing fibre materials. 4,120,647, Cl. 8-17.000.

Laval, Claude C., Jr. Device for separating a plural phase fluid system into its constituent phases. 4,120,795, Cl. 210-512.00R.

Lawrence, Dean M., to Caterpillar Tractor Co. Cab design. 4,120,527, Cl. 296-28.00C.

Leadbetter, Laurence D.: *See—*
Carp, Ralph W.; Ang, Leoncio T.; Leadbetter, Laurence D.; and Cornell, Grant Arthur, 4,120,539, Cl. 503-103.000.

Leal, Jean-Claude; Vannetzel, Henri; Grima, Jean-Claude; and David, Guy Albert Jules, to Telecommunications Radioelectriques et Telephoniques T.R.T. Alarm filtering in a ground proximity warning system. 4,121,287, Cl. 364-461.000.

Leang, William N. C.: *See—*
Otto, Paul R.; and Leang, William N. C., 4,120,381, Cl. 187-29.00R.

Leary, Bruce: *See—*
Gibson, David Vincent; and Leary, Bruce, 4,120,768, Cl. 204-181.00C.

LeBlanc, Oliver H., Jr.; Niedrach, Leonard W.; and Stoddard, William H., Jr., to General Electric Company. Implantable electrochemical sensor having an external reference electrode. 4,120,292, Cl. 128-2.00E.

Lebourg, Maurice P. Method and apparatus for determining the spatial relationship between two misaligned tubular members. 4,120,095, Cl. 33-180.00R.

Lebre, Charles Jean-Pierre. System employing a strap for stowing containers against a wall. 4,120,076, Cl. 24-68.0CD.

Lednicer, Daniel, to Upjohn Company, The. Polycycloanilines. 4,120,899, Cl. 260-562.00R.

Lee, Cheuk Man; and Michaels, Raymond John, to Sharps Associates. 9-Hydroxy-7,8,9,10-tetrahydro-6H-dibenzo]B][D]pyranones. 4,120,873, Cl. 260-343.210.

Lee, Choon Bae; and Lim, Byung Chul. Filter for cigarettes, cigars and the like. 4,120,310, Cl. 131-261.00B.

Lee-You, James: *See—*
Smyth, Milagros B.; and Lee-You, James, 4,120,729, Cl. 106-35.000.

Leeming, Harold, to United States of America, Air Force. Method of using embedded normal stress sensors in propellant grains. 4,120,195, Cl. 73-768.000.

Leenhouts, Albert C., to Superior Electric Company, The. Stepping motor energizing circuit and method for minimizing step position error. 4,121,144, Cl. 318-696.000.

Le Hardy Guiton, Jeremy D.: *See—*
Collins, Michael H.; and Le Hardy Guiton, Jeremy D., 4,120,418, Cl. 220-444.000.

Leimala, Raimo Juhani: *See—*
Hummelstedt, Leif Erik Ingmar; Nyman, Bror Goran; and Leimala, Raimo Juhani, 4,120,817, Cl. 252-364.000.

Leising, Larry J.: *See—*
Tanguy, Denis R.; and Leising, Larry J., 4,120,198, Cl. 73-151.000.

Lemelson, Jerome H. Button assembly for textile material. 4,120,054, Cl. 2-265.000.

Lemelson, Jerome H. Method for molding. 4,120,922, Cl. 264-40.700.

Lemelson, Jerome H. Method of coating a composite mold. 4,120,930, Cl. 264-225.000.

Lemelson, Jerome H. Card recording and reproduction apparatus and method. 4,121,249, Cl. 358-132.000.

LeMire, Paul R., to Ackerman Bodnar Corporation. Fiber optic message character display device and method of making same. 4,121,206, Cl. 340-380.000.

Lemley, Robert M.: *See—*
Iverson, Harold L.; and Lemley, Robert M., 4,120,280, Cl. 126-30.000.

Lenz, Arnold: *See—*
Haase, Rainer; Hunger, Volker; and Lenz, Arnold, 4,120,938, Cl. 423-332.000.

LeRoch, Jacques. Stop valve. 4,120,483, Cl. 251-229.000.

Leroux, Yves Gerald. Expansion joint for roadway sections. 4,120,066, Cl. 14-16.500.

Lersmacher, Bernhard: *See—*
Krol, Johannes Wilhelmus Antonius; Lersmacher, Bernhard; and Seifert, Horst, 4,120,080, Cl. 29-25.180.

Lessner, David L., to Baxter Travenol Laboratories, Inc. Method and means for aligning focusing mirrors in an optical spectrometer. 4,120,586, Cl. 356-100.000.

Leutner, Volkmar; and Romes, Roman, to Robert Bosch GmbH. Injection-molding machine for synthetic plastic material. 4,120,631, Cl. 425-145.000.

Levaillant, Claude: *See—*
Azam, Guy; Bensussan, Andre; and Levaillant, Claude, 4,121,173, Cl. 331-9.000.

Levine, Aaron William: *See—*
Goodman, Lawrence Alan; Levine, Aaron William; and Meyerhofer, Dietrich, 4,120,567, Cl. 350-350.000.

Levitt, George, to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,120,691, Cl. 71-93.000.

Levitt, George: *See—*
Goddard, Steven Jerome; and Levitt, George, 4,120,693, Cl. 71-96.000.

Levy, Abraham. Self-balancing continuous power transmission system and method. 4,120,213, Cl. 74-688.000.

Lewin, Menachem: *See—*
Lopatin, George; and Lewin, Menachem, 4,120,141, Cl. 57-34.0HS.

Lewis, Harvey L. Coupon holder. 4,120,313, Cl. 137-268.000.

Lewis, Philip J.: *See—*
Bice, John R.; and Lewis, Philip J., 4,120,970, Cl. 424-270.000.

Light, Kenneth K.; Sanders, James Milton; Vock, Manfred Hugo; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja Dulal; Tseng, Ching Y.; and Sprecker, Mark A., to International Flavors & Fragrances Inc. Substituted norbornane derivatives used in the process of flavoring tobacco and the product thereof. 4,120,308, Cl. 131-17.00R.

Lim, Byung Chul: *See—*
Lee, Choon Bae; and Lim, Byung Chul, 4,120,310, Cl. 131-261.00B.

Lin, Ben H.: *See—*
Hunt, Raymond L.; Lin, Ben H.; Ream, Thomas A.; Robertson, Gene D.; and Young, John H., 4,121,135, Cl. 315-169.00R.

Lindemann Maschinenfabrik GmbH: *See—*
Schafer, Anton; Probst, Karl; and Hufken, Kurt, 4,120,238, Cl. 100-11.000.

Linge, Hermann: *See—*
Martin, Wolfgang; Bauer, Wolfgang; Herion, Dieter; Linge, Hermann; and Knopp, Hans, 4,120,078, Cl. 28-252.000.

Link, Donald F., to Recovery Systems, Inc. Pulverizer. 4,120,457, Cl. 241-46.00R.

Linner, Hans Rolf Ingemar, to AB Akerlund & Rausing. Carton sealing strip applicator. 4,120,741, Cl. 156-522.000.

Linzey, Raynor: *See—*
Ross, Sidney D.; and Linzey, Raynor, 4,121,275, Cl. 361-319.000.

Lissau, Frederic, to Sloan Valve Company. Remote actuated flush valve. 4,120,314, Cl. 137-329.400.

Litch, Ivan J. Nail driver. 4,120,438, Cl. 227-147.000.

Little, Donald H.; and Spector, George. Fly swatter with extendable handle. 4,120,114, Cl. 43-137.000.

Liverant, Vladimir Leibovich; Yagupolsky, Lev Moiseevich; Ilichenko, Andrei Yakovlevich; Timashpolskaya, Faina Borisovna; Fedorovskaya, Elena Alexeevna; Petrik, Lidia Ivanovna; Kalantarov, Iosif Yakubovich; Kopylova, Mira Semenovna; and Meitus, Idima Evgenievna. Bactericidally active monochlorotriazine dyes. 4,120,855, Cl. 260-153.000.

Livshits, Anatoly Alexandrovich: *See—*
Auslender, Vadim Leonidovich; Budker, Gersh Itskovich; Glagolev, Georgy Borisovich; Livshits, Anatoly Alexandrovich; Perepelkin, Vitaly Petrovich; Polyakov, Vladimir Arkhipovich; Chepel, Lev Vladimirovich; Chertok, Ilya Lvovich; and Cheskidov, Vladimir Georgievich, 4,121,086, Cl. 219-121.0EM.

Lo, Allen Kwok Wah; and Nims, Jerry Curtis, to Dimensional Development Corporation. Stereoscopic picture. 4,120,562, Cl. 350-130.000.

Lohn, Gerd, to Kaltenbach & Voigt GmbH & Co. Pneumatic vane-type motor with bearing ring for vane tips. 4,120,623, Cl. 418-173.000.

Long, Eric L., to Cutler-Hammer, Inc. Snap-action electric switch with fulcrum means for limited contact sliding and positive-off torque. 4,121,069, Cl. 200-67.00A.

Longobardi, Mario; Schenone, Pietro; and Bondavalli, Francesco. Derivatives of 1,2,3,3-tetramethyl-2-azabicyclo[2.2.2]octan-5-endo-ol. 4,120,857, Cl. 260-293.540.

Lopatin, George; and Lewin, Menachem, to State of Israel Ministry of Commerce and Industry, The. Process and apparatus for the production of textured polyester yarn. 4,120,141, Cl. 57-34.0HS.

Lopez, Eugene F.: *See—*
Glover, Leon C.; and Lopez, Eugene F., 4,121,011, Cl. 428-347.000.

Lopez, Manuel: *See—*
Bourassa, Joseph R.; and Lopez, Manuel, 4,120,476, Cl. 248-486.000.

Lorteije, Jean Hubertus Josef; and Warrink, Geert, to U.S. Philips Corporation. Column electrode drive for gas discharge display device. 4,121,256, Cl. 358-240.000.

Love, Roosevelt: *See—*
Childs, Jerry D.; and Love, Roosevelt, 4,120,736, Cl. 106-90.000.

Lovendahl, Norman H. Boring tool. 4,120,599, Cl. 408-150.000.

Lovick, James Shepperd. Apparatus for surgical procedures involving animals. 4,120,301, Cl. 128-303.00R.

Lowe, Keith B.; and Gray, William R., to Allis-Chalmers Corporation. Impact crusher with retractable and tiltable feed chute. 4,120,459, Cl. 241-186.200.

Lubbock Manufacturing Company: *See—*
Hurt, Henry Wayne, 4,120,513, Cl. 280-423.00B.

Lucas Industries Limited: *See—*
Hill, William Frank, 4,121,146, Cl. 320-48.000.

Luder, Jacques, to Societe Anonyme dite Compagnie Industrielle des Telecommunications Cit-Alcatel. Frame synchronizing device. 4,121,057, Cl. 179-15.0BS.

Ludlow Corporation: *See—*
Carrier, Lee A.; and Carpenter, Leon G., 4,120,445, Cl. 229-53.000.

Lueder, Guenther: *See—*
Hofmann, Wilfried; Lueder, Guenther; Rauffer, Walter; Krueger, John; and Koopmann, Adolf, 4,120,574, Cl. 353-27.00R.

Lush, Richard C. Mattress construction. 4,120,060, Cl. 5-345.00R.

Lutz, Charles William, to FMC Corporation. Polyethylene glycol-stabilized peroxygens. 4,120,812, Cl. 252-186.000.

Lutzke, William C.: *See—*
Blink, Robert O.; and Lutzke, William C., 4,120,249, Cl. 108-113.000.
Luzzi, John J.: *See—*
Spivack, John D.; and Luzzi, John J., 4,120,846, Cl. 260-45.85B.
Lynn, Charles Carl, to Stauffer Chemical Company. Whole egg replacer. 4,120,986, Cl. 426-549.000.
Lzicar, Josef: *See—*
Bezstarosti, Ladislav; Lzicar, Josef; Lanta, Jiri; and Kriz, Vladimir, 4,120,326, Cl. 139-55.100.
M&T Chemicals Inc.: *See—*
Bednarski, John R.; and Russell, David B., 4,121,034, Cl. 526-240.000.
Hirshman, Justin L.; and Russo, Robert V., 4,120,875, Cl. 260-346.110.
Maas, Edward T., Jr.: *See—*
DeLuca, John P.; and Maas, Edward T., Jr., 4,120,936, Cl. 423-261.000.
Macey, Peter E.: *See—*
Bristow, Norman W.; Macey, Peter E.; Nichol, Kenneth J.; and Sim, Malcolm F., 4,120,960, Cl. 424-250.000.
MacPherson, Edwin J.: *See—*
Brouwer, Walter G.; MacPherson, Edwin J.; Ames, Ronald B.; Neidermyer, Robert W.; and Crittendon, Charles E., 4,120,861, Cl. 260-302.00D.
Macrory, Richard Brabazon; and Young, Nicholas Gordon. Chase-type board game. 4,120,503, Cl. 273-244.000.
Maeda, Katsuaki: *See—*
Sakurai, Hisaya; Morita, Hideo; Ikegami, Tadashi; Maeda, Katsuaki; and Furusato, Masayasu, 4,120,883, Cl. 260-448.00A.
Magee, David S.: *See—*
Dugan, Judith A., 4,120,100, Cl. 35-73.000.
Magee, Robert L.: *See—*
Kennedy, Alvin B., Jr.; Shirey, Lawrence E.; Sharp, Harper Eugene; Trowbridge, Lawrence E.; and Magee, Robert L., 4,120,699, Cl. 134-1.000.
Magnavox Company, The: *See—*
Hunt, Raymond L.; Lin, Ben H.; Ream, Thomas A.; Robertson, Gene D.; and Young, John H., 4,121,135, Cl. 315-169.00R.
Magnetic Peripherals Inc.: *See—*
Garde, Lawrence, 4,121,172, Cl. 331-1.00A.
Rodd, Charles R.; and Scheuerman, Richard L., 4,120,217, Cl. 81-9.510.
Mahan, John E.: *See—*
Fahey, Darryl R.; and Mahan, John E., 4,120,907, Cl. 260-666.00B.
Mahieu, William R., to A. B. Chance Company. High speed ratio, dual fuse link. 4,121,187, Cl. 337-171.000.
Mailloux, Louis D.; and Bollman, James E., to Xerox Corporation. Collating system for slide reproduction. 4,120,580, Cl. 355-14.000.
Maiorano, Dominick J., to Xerox Corporation. Imaging system for a photocopying device. 4,120,579, Cl. 355-11.000.
Majcher, John P.: *See—*
Rexroad, James O.; and Majcher, John P., 4,121,067, Cl. 200-50.0AA.
Makimoto, Mitsuo; and Yamashita, Sadahiko, to Matsushita Electric Industrial Co., Limited. Electrical tuning circuit. 4,121,182, Cl. 333-73.00S.
Malaval, Claude, to Groupement Atomique Alsacienne Atlantique. Solid absorbant safety device for a nuclear reactor. 4,120,753, Cl. 176-86.00R.
Malec, Robert E., to Ethyl Corporation. Lubricant composition containing a dispersant which is a condensation product of a copolymer, polyamine and a polycarboxylic acid. 4,120,803, Cl. 252-51.50A.
Mallory, James D.; Fleck, John F.; and Cuniberti, Mario, to Owens-Illinois, Inc. Mold ring transfer apparatus. 4,120,684, Cl. 65-302.000.
Malmuth, Norman D.; Birnbaum, George; and Iceland, William F., to Rockwell International Corporation. Method and apparatus for controlling laser welding. 4,121,087, Cl. 219-121.00L.
Maloney, Thomas C., to Burroughs Corporation. Display panel and method of manufacture thereof. 4,121,129, Cl. 313-221.000.
Mama, Kelly D.; and Roller, Otto C., to Channon Corporation. Aircraft hanger door. 4,120,342, Cl. 160-310.000.
Mandel, Harvey B.; and Thyen, Eberhard H., to Ethicon, Inc. Package for double-armed sutures. 4,120,395, Cl. 206-63.300.
Mandusky, Jack C.: *See—*
Kitchen, John P.; and Mandusky, Jack C., 4,120,058, Cl. 5-247.000.
Mann, David R. Oiler for motorcycle drive chains. 4,120,380, Cl. 184-15.00R.
Manor, George H. X-ray film marking device and methods of making and using the same. 4,121,108, Cl. 250-476.000.
Manor, Nathan. Displaceable garbage bin holder. 4,120,548, Cl. 312-249.000.
Manos, Philip, to Du Pont de Nemours, E. I., and Company. Solvent exchange drying of membranes for gas separation. 4,120,098, Cl. 34-9.000.
Marchessault, Richard G.; Carter, Thomas P., Jr.; and Williams, Martin M., to Celanese Polymer Specialties Company. Pressure sensitive adhesive composition. 4,121,028, Cl. 526-48.100.
Marcucci, Robert L.: *See—*
Bunch, Carroll S.; Perry, Jerry L.; and Marcucci, Robert L., 4,121,216, Cl. 343-113.00R.
Marinaccio, Richard E.; and Meier, Ward M., to United States of America, Air Force. Proximity fuze jammer. 4,121,214, Cl. 343-18.00E.
Marklund, Karl Georg Erhard: *See—*
Hellgren, Hans Arthur; and Marklund, Karl Georg Erhard, 4,120,333, Cl. 144-312.000.
Marles, Kevin C.; Spencer, Brian W.; and Spencer, Raymond, to Solar Apparatus & Equipment Limited. Solar heating panels. 4,120,287, Cl. 126-271.000.
Marshall Richards Barcro Limited: *See—*
Pamplin, John Warner; Bennett, James Vine; and Elson, Peter Fred, 4,120,186, Cl. 72-278.000.
Martin, Charles K., to Infern-O-Therm Corporation. Burner for liquid fuel. 4,120,640, Cl. 431-353.000.
Martin Marietta Corporation: *See—*
Popkin, Philip, 4,121,054, Cl. 179-15.0BD.
Martin, William H., to Raymond Lee Organization, Inc., The, a part interest. Golf game apparatus. 4,120,502, Cl. 273-176.00R.
Martin, Wolfgang; Bauer, Wolfgang; Herion, Dieter; Linge, Hermann; and Knopp, Hans, to BASF Aktiengesellschaft. Simultaneous texturizing and entangling of filament bundles. 4,120,078, Cl. 28-252.000.
Marvin Glass & Associates: *See—*
Schlau, Floyd E.; and Morrison, Howard J., 4,120,190, Cl. 72-458.000.
Terzian, Rouben T.; Morrison, Howard J.; Schoenfield, Palmer J.; and Kuna, Wayne A., 4,120,117, Cl. 46-130.000.
Marx, Matthias: *See—*
Kovacs, Jenoe; Jung, Hans; Marx, Matthias; and Spoor, Herbert, 4,121,266, Cl. 528-288.000.
Marxer, S.p.A.: *See—*
Cagliero, Germano, 4,120,977, Cl. 424-285.000.
Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Heeren, Hermann, 4,120,162, Cl. 60-690.000.
Maschinenfabrik Hennecke GmbH: *See—*
Keller, Heinrich, 4,120,626, Cl. 425-89.000.
Mascia, Carmen T.; and Hasegawa, Gary K., to Continental Group, Inc., The. Reusable can carrier with can enlocking means on opposite surfaces. 4,120,396, Cl. 206-151.000.
Mason, Donald R., to Harris Corporation. Heteroepitaxial deposition of gap on silicon substrates. 4,120,706, Cl. 148-175.000.
Massey-Ferguson Inc.: *See—*
Rose, Jack Howard, 4,120,136, Cl. 56-17.100.
Massey-Ferguson Services N.V.: *See—*
Hartwich, Siegfried, 4,120,372, Cl. 180-9.500.
Masuda, Takao: *See—*
Ikenoue, Shinpei; and Masuda, Takao, 4,120,728, Cl. 96-114.100.
Matburn (Holdings) Limited: *See—*
Ockwell, Malcolm Charles; McLeod, Patrick Hugh; and Briggs, Peter James, 4,120,715, Cl. 156-252.000.
Mathews, Lorraine: *See—*
Mathews, Richard; and Mathews, Lorraine, 4,120,118, Cl. 46-201.000.
Mathews, Richard; and Mathews, Lorraine. Semi-disassemblable toy vehicle. 4,120,118, Cl. 46-201.000.
Matsumoto, Hiroshi; Nakano, Yoshiyuki; Higashi, Toshihiko; and Yasumoto, Akihiro, to Hitachi, Ltd. Steam turbine control system and method of controlling the ratio of steam flow between under full-arc admission mode and under partial-arc admission mode. 4,120,159, Cl. 60-667.000.
Matsumoto, Seiji; Takahashi, Isoji; Komaki, Takao; Ishida, Masamitsu; Kozeki, Tomotaka; Horikawa, Kazuo; and Shimanuki, Kozi, to Fuji Photo Film Co., Ltd. Method of recording radiographic images. 4,121,101, Cl. 250-315.00A.
Matsumoto, Youichi; and Tagashira, Yoshimi, to Nippon Electric Co., Ltd. Phase synchronizing circuit for demodulation of multi-phase PSK signals. 4,121,166, Cl. 329-122.000.
Matsumoto, Zenji: *See—*
Numasaki, Kouichi; Sakai, Yoshihisa; Nawa, Takehiko; Matsumoto, Zenji; and Ninomiya, Nobutaka, 4,120,644, Cl. 432-99.000.
Matsunami, Koichi: *See—*
Furukawa, Kaoru; Matsunami, Koichi; Ota, Toshihiko; Murakami, Tetsushi; Nagai, Hiroshi; and Tamaki, Kazuo, 4,120,928, Cl. 264-171.000.
Matsuno, Tadahiko: *See—*
Kubo, Sueki; Watanabe, Toshiro; Fujita, Masayuki; Matsuno, Tadahiko; and Morita, Akira, 4,120,260, Cl. 118-317.000.
Matsushita Electric Industrial Co., Limited: *See—*
Aimi, Mitsuo, 4,121,063, Cl. 200-18.000.
Hatanaka, Hideo; Murakami, Yoshinobu; and Morimoto, Kazuhisa, 4,120,813, Cl. 252-194.000.
Hayashi, Yoshiaki, 4,121,267, Cl. 360-85.000.
Kimura, Atsushi; and Ishimoto, Tasuku, 4,120,452, Cl. 235-381.000.
Makimoto, Mitsuo; and Yamashita, Sadahiko, 4,121,182, Cl. 333-73.00S.
Nakabe, Ryuhei; Ohta, Yoshio; and Matsuura, Toshiro, 4,121,244, Cl. 358-44.000.
Ogawa, Hiromichi; Inoue, Kenji; and Fujiwara, Akira, 4,121,021, Cl. 429-162.000.
Takano, Teruhisa; Kurata, Noboru; Kusunoki, Shigeru; and Yoshimura, Hirofumi, 4,121,078, Cl. 219-10.55F.
Tsuboi, Yoshikazu; and Uzu, Yoshitomo, 4,121,198, Cl. 340-171.00R.
Yamaguchi, Namio; and Sato, Yasuyuki, 4,121,243, Cl. 358-19.000.
Matsuura, Toshiro: *See—*
Nakabe, Ryuhei; Ohta, Yoshio; and Matsuura, Toshiro, 4,121,244, Cl. 358-44.000.
Matucheski, Joseph Victor, to Wallace Murray Corporation. Sheet metal fan blade forming process. 4,120,257, Cl. 113-116.00D.
Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Hammann, In-

geborg; Behrenz, Wolfgang; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Combating arthropods with 3-alkoxymethyl- and-alkylthiomethyl-pyrazol(5)yl(thiono)(thiol)-phosphoric(phosphonic) acid esters and ester-amides. 4,120,956, Cl. 424-200.000.

Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See*—
Jagoutz, Emil; and Palme, Christl, 4,121,098, Cl. 250-273.000.
Kessler, Manfred, 4,120,770, Cl. 204-195.00R.

Mayer, Roland: *See*—
Hanisch, Gerhard; Fischer, Gunther; Gahler, Seigfried; Franz, Udo; Kuschel, Karl; Mayer, Roland; Bach, Gunther; and Junge, Karl-Wilhelm, 4,120,726, Cl. 96-107.000.

Mazzei, Umberto: *See*—
Dogliotti, Renato; Mazzei, Umberto; and Mengali, Umberto, 4,121,165, Cl. 329-50.000.

Mazzoleni, Giorgio: *See*—
Vargiu, Silvio; Mazzoleni, Giorgio; and Pezzoli, Silvestro, 4,120,685, Cl. 71-30.000.

McBain, Alexander J. Apparatus for agitating a fishing line. 4,120,112, Cl. 43-19.200.

McBride, Richard D.: *See*—
Quinlan, Patrick M.; and McBride, Richard D., 4,120,654, Cl. 422-16.000.

McCall, Samuel Leverte, Jr.: *See*—
Gibbs, Hyatt McDonald; McCall, Samuel Leverte, Jr.; and Venkatesan, Thirumalai Nallan Chakravarthy, 4,121,167, Cl. 330-4.300.

McCarter, Henry: *See*—
Gutcho, Sidney; and McCarter, Henry, 4,120,945, Cl. 424-1.000.

McClain, Robert W., to Glitsch, Inc. Quick opening removable tray sections for fluid contact. 4,120,919, Cl. 261-114.0TC.

McConnell, Joseph W. Folding rack and work table. 4,120,485, Cl. 254-88.000.

McConnell, Richard L.: *See*—
Meyer, Max F., Jr.; and McConnell, Richard L., 4,120,916, Cl. 260-897.00A.

McCoy, Reginald F. H., to Vital Industries, Inc. Video special effects generator. 4,121,253, Cl. 358-181.000.

McCulloch Corporation: *See*—
Ehlen, Jack W., 4,120,277, Cl. 123-148.0CC.

McEwan, Keith John Bruce, to Joseph Lucas (Batteries) Limited. Method of securing a battery terminal to an external wall. 4,120,087, Cl. 29-623.200.

McGean Chemical Co.: *See*—
Jameson, Melvin Neil; Klicker, James Donald; Krulik, Gerald Albert; and York, James Farnsworth, 4,120,822, Cl. 252-441.000.

McGrath-Hamin, Inc.: *See*—
Newman, Thomas A., 4,120,401, Cl. 206-566.000.

McInerney, Charles E., to Garrett Corporation, The. Turbocharger control. 4,120,156, Cl. 60-602.000.

McLain, Philippe Hardy-The, to Shakespeare Company. Monofilament sewing thread. 4,120,255, Cl. 112-222.000.

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McLeod, Patrick Hugh: *See*—
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McPherson, Charles Allen, to Western Electric Company, Inc. Cured epoxy polymer having improved adhesive properties. 4,121,015, Cl. 428-418.000.

McRoskey, John W.; McRoskey, Leonard H.; and Swartz, Delbert D., to Republic Tool & Manufacturing Corp. Powder gun. 4,120,427, Cl. 222-193.000.

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McRoskey, John W.; McRoskey, Leonard H.; and Swartz, Delbert D., 4,120,427, Cl. 222-193.000.

McVean, Michael T.: *See*—
Bowen, Leon O., Jr.; and McVean, Michael T., 4,120,290, Cl. 126-299.00D.

Meadows, Lee A., to Raytheon Company. Radio frequency array antenna system. 4,121,221, Cl. 343-854.000.

Mecherlen, Otto, to Raymond Lee Organization, Inc., The. Vertical barbecue. 4,120,237, Cl. 99-340.000.

Meckstroth, Alan F. Hanger for supporting pants and the like. 4,120,433, Cl. 223-95.000.

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Medtronic, Inc.: *See*—
Jirak, Thomas L.; and Mulier, Pieter M. J., 4,120,307, Cl. 128-419.0PT.

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Mehnert, Walter, to Director Ing. Fritz Loertscher. Method and apparatus for the slip-free hauling of a rope or the like. 4,120,486, Cl. 254-150.00R.

Meier, Ward M.: *See*—
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Meigs, Gordon Wallace; and Thomas, Wayne Donald, to Tektronix, Inc. Pulse peak detector. 4,121,119, Cl. 307-351.000.

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Dogliotti, Renato; Mazzei, Umberto; and Mengali, Umberto, 4,121,165, Cl. 329-50.000.

Merck & Co., Inc.: *See*—
Czaja, Robert F.; and Grabowski, Edward J. J., 4,121,041, Cl. 544-21.000.
Saari, Walfred S.; and Huff, Joel R., 4,120,971, Cl. 424-272.000.

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Ripphahn, Johannes; and Kriegbaum, Ernst, 4,120,205, Cl. 73-425.600.

Merezhkin, Vasily Grigorievich. System for automatic control of object by contrast program. 4,121,096, Cl. 250-202.000.

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Smith, Charles A.; and Merritt, John H., 4,120,241, Cl. 100-142.000.

Messenger, Joseph U., to Mobil Oil Corporation. Treating wells to mitigate flow-after-cementing. 4,120,360, Cl. 166-293.000.

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Banga, Julius, 4,121,281, Cl. 363-17.000.
Bschorr, Oskar, 4,120,382, Cl. 188-1.00B.

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Becker, Herbert, 4,120,120, Cl. 49-351.000.

Metco, Inc.: *See*—
Harrington, John H.; Smyth, Richard T.; and Weir, John D., 4,121,082, Cl. 219-76.160.
Smyth, Richard T., 4,121,083, Cl. 219-76.160.

Metzeler Kautschuk AG: *See*—
Rost, Harry, 4,120,717, Cl. 156-405.00R.

Meyer, Eckhard: *See*—
Berndes, Gunter; and Meyer, Eckhard, 4,121,239, Cl. 357-39.000.

Meyer, Fred J.; and Newman, Seymour, to Ford Motor Company. Molded calcium carbonate filled propylene resin composites. 4,120,844, Cl. 260-42.000.

Meyer, Max F., Jr.; and McConnell, Richard L., to Eastman Kodak Company. Amorphous and crystalline polyolefin based hot-melt adhesive. 4,120,916, Cl. 260-897.00A.

Meyerhofer, Dietrich: *See*—
Goodman, Lawrence Alan; Levine, Aaron William; and Meyerhofer, Dietrich, 4,120,567, Cl. 350-350.000.

Michael, Harald Richard. Vacuum-type water removal systems for buildings. 4,120,312, Cl. 137-236.00R.

Michaels, Raymond John: *See*—
Lee, Cheuk Man; and Michaels, Raymond John, 4,120,873, Cl. 260-343.210.

Michalchik, Michael, to Dynacon Industries, Inc. Pressure sensitive resistance and process of making same. 4,120,828, Cl. 252-513.000.

Michel, Edmond; Duikers, Marcel; and Poty, Andre, to Solvay & Cie. Apparatus for the continuous production of oriented hollow bodies from a thermoplastic. 4,120,634, Cl. 425-525.000.

Michele, Joseph V.: *See*—
Campos, Adolph J.; and Michele, Joseph V., 4,120,620, Cl. 418-61.00A.

Micheletti, Fabrizio, to Brematex S.p.A. Radially insertable and pivotable cams. 4,120,177, Cl. 66-40.000.

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Michelman, David L.: *See*—
Michelman, Lionel S.; Michelman, Samuel M.; Michelman, David L.; and Michelman, Milton, 4,120,182, Cl. 70-63.000.

Michelman Iron Works Corp.: *See*—
Michelman, Lionel S.; Michelman, Samuel M.; Michelman, David L.; and Michelman, Milton, 4,120,182, Cl. 70-63.000.

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Microbox Dr. Welp GmbH & Co.: *See*—
Welp, Ulrich; and Sellien, Gero, 4,121,236, Cl. 354-323.000.

Microcom Corporation: *See*—
Doherty, Michael J., 4,121,055, Cl. 179-15.00A.

Midden, William E.: *See*—
Funk, David B.; and Midden, William E., 4,121,151, Cl. 324-61.00R.

Middleton, Verne L.: *See*—
Kleine, Charles A.; and Middleton, Verne L., 4,120,351, Cl. 165-170.000.

Middleton, William Joseph: *See—*
Bingham, Elena Maria; and Middleton, William Joseph, 4,120,856, Cl. 260-239.30D.
Midland-Ross Corporation: *See—*
Suk, Eugene J., 4,120,416, Cl. 220-3.400.
Suk, Eugene J., 4,120,473, Cl. 248-205.00R.
Thekdi, Arvind C.; Chojnacki, Dennis A.; and Hemsath, Klaus H., 4,120,639, Cl. 431-158.000.
Milberger, Ernest C.: *See—*
Bremer, Noel J.; White, James F.; and Milberger, Ernest C., 4,120,876, Cl. 260-346.750.
Millard, Barry John, to Adwest Engineering Limited. Ball joint. 4,120,597, Cl. 403-24.000.
Miller, Charles P., to Miller Formless Co. Inc. Compensated extendable steering means for heavy machines. 4,120,507, Cl. 280-6.00R.
Miller Formless Co. Inc.: *See—*
Miller, Charles P., 4,120,507, Cl. 280-6.00R.
Miller, Jan D.; and Sepulveda, Jaime E., to University of Utah. Separation of bitumen from dry tar sands. 4,120,776, Cl. 208-11.0LE.
Miller, Robert E.; and Brockett, Bruce W., to NCR Corporation. Record material. 4,121,013, Cl. 428-411.000.
Miller, Roy W.; and Nagy, Ernest J., to Pullman Incorporated. Trackside door closing arrangement for railway hopper cars. 4,120,412, Cl. 214-63.000.
Mills, E. Bennett: *See—*
Mills, Ernest E.; Mills, E. Bennett; and Mills, Stanley L., 4,120,378, Cl. 182-14.000.
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Mills, James M.: *See—*
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Mills, Stanley L.: *See—*
Mills, Ernest E.; Mills, E. Bennett; and Mills, Stanley L., 4,120,378, Cl. 182-14.000.
Mima, Yoshitada; Kubushiro, Naoaki; and Kojima, Koji, to Hitachi Denshi Kabushiki Kaisha; and Kabushiki Kaisha Banzai. Method and apparatus for measuring the distribution of a light field about the optical axis of a light source. 4,120,589, Cl. 356-121.000.
Minamikawa, Yoshihisa: *See—*
Kubozoe, Morioki; Minamikawa, Yoshihisa; and Katagiri, Shinjiro, 4,121,100, Cl. 250-311.000.
Minekawa, Saburo; Yonekawa, Sigeru; Tabata, Haruro; Ishida, Takashi; Tsuchida, Satoshi; and Yamada, Kiyoshi. Process for producing random copolymers. 4,121,031, Cl. 526-173.000.
Minerec Corporation: *See—*
Bolth, Franklin Anderson, 4,120,888, Cl. 260-463.000.
Minnesota Mining and Manufacturing Company: *See—*
Hudalla, Mark G., 4,120,718, Cl. 156-499.000.
Roberts, Charles William, 4,121,005, Cl. 428-131.000.
Mioen, Thomas K., to Boliden Aktiebolag. Method for working-up shale. 4,120,934, Cl. 423-18.000.
Mirtain, Henri J. Pneumatic tire having an improved heel structure. 4,120,338, Cl. 152-354.00R.
Mischutin, Vladimir, to White Chemical Corporation. Flame retardants for synethetic materials. 4,120,798, Cl. 252-8.100.
Mishaeva, Rimma Nikodimovna: *See—*
Kuznetsova, Nadezhda Nikolaevna; Samsonov, Georgy Vasilievich; Papukova, Klavdia Pavlovna; Bilibina, Galina Vladimirovna; Shataeva, Larisa Konstantinovna; Selezneva, Aida Alexandrovna; Kuznetsova, Nina Petrovna; Vitols, Oyar Ansovich; Shtrausa, Anite Ansovna; Gudkin, Lev Romanovich; Mishaeva, Rimma Nikodimovna; and Rozhetskaya, Karina Moiseevna, 4,120,831, Cl. 521-38.000.
Mishima, Kiyoshi: *See—*
Torii, Sigeru; Tanaka, Hideo; and Mishima, Kiyoshi, 4,120,764, Cl. 204-78.000.
Mitchell Manufacturing Company: *See—*
Blink, Robert O.; and Lutzke, William C., 4,120,249, Cl. 108-113.000.
Mitchell, Winalee G. Laundry bag. 4,120,335, Cl. 150-7.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Tanaka, Masaharu, 4,121,075, Cl. 200-148.00A.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Ueda, Kenji, 4,120,760, Cl. 204-55.00R.
Mitsuboshi Belting Limited: *See—*
Kanamori, Katsuo; Sakurai, Nobuo; and Arai, Ryozo, 4,120,785, Cl. 209-401.000.
Miyauchi, Kohichiroh; Ohsumi, Atsushi; Haga, Yukio; Izumi, Tsutomu; Tsuru, Masahiro; Kunioka, Kazuo; and Sugiyama, Shunichi, to Nippon Kokan Kabushiki Kaisha. Method for heating ingot in soaking pit. 4,120,642, Cl. 432-12.000.
Miyazaki, Seiichi, to Ohkura Electric Co., Ltd. Bipolar signal generating apparatus. 4,121,118, Cl. 307-262.000.
Mizuno, Masaya: *See—*
Takeuchi, Jikko; and Mizuno, Masaya, 4,121,224, Cl. 346-139.00C.
Mobil Oil Corporation: *See—*
Audeh, Costandi A.; and Yan, Tsoung-Yuan, 4,120,782, Cl. 208-305.000.
Braddon, George Dayman, Sr., 4,120,398, Cl. 206-408.000.
Chen, Catherine S. H.; Schwab, Frederick C.; and Sheppard, Edward W., 4,120,801, Cl. 252-8.55D.
Chu, Pochen, 4,120,910, Cl. 260-673.000.
Messenger, Joseph U., 4,120,360, Cl. 166-293.000.
Schmitt, Kirk D., 4,120,917, Cl. 260-976.000.
Moeckli, David Edward: *See—*
White, Robert Edward; and Moeckli, David Edward, 4,121,113, Cl. 307-140.000.
Molins, Desmond Walter; Hinchcliffe, Dennis; and Clarke, Peter Alec, to Molins Limited. Conveyor systems for cigarettes and other rod-like articles. 4,120,391, Cl. 198-347.000.
Molins Limited: *See—*
Molins, Desmond Walter; Hinchcliffe, Dennis; and Clarke, Peter Alec, 4,120,391, Cl. 198-347.000.
Molnar, Imre. Two-passage pipe, especially for air conditioning installations. 4,120,347, Cl. 165-48.00R.
Molzahn, Martin: *See—*
Gettert, Hans; Fromm, Hermann Dieter; Molzahn, Martin; Schier, Ernst-Juergen; and Schneehage, Hans Henning, 4,120,667, Cl. 55-48.000.
Monarch Marking Systems, Inc.: *See—*
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Moncheaux, Michel Jean: *See—*
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Monsanto Company: *See—*
Baldyga, Eugene P., 4,120,135, Cl. 53-473.000.
Chi, Henry K.; and Higgins, Alton L., 4,120,851, Cl. 260-880.00R.
Crutchfield, Marvin M.; and Lannert, Kent P., 4,120,874, Cl. 260-345.80R.
Culbertson, Harry M., 4,120,847, Cl. 528-140.000.
Dutra, Gerard A., 4,120,689, Cl. 71-86.000.
Hobbs, Charles F.; and McMackins, Dudley E., 4,120,901, Cl. 260-585.00D.
Steinmeyer, Daniel E., 4,120,671, Cl. 55-96.000.
White, Donald A., 4,120,761, Cl. 204-59.00R.
Montajes Electronicos Dorcas S.A.: *See—*
Fayos, D. Jose Antonio Navarro, 4,120,523, Cl. 292-268.000.
Montanarello, Benedict. Light image target with elevating and rotating projector. 4,120,500, Cl. 273-101.000.
Montedison S.p.A.: *See—*
Fatutto, Pierluigi, 4,120,834, Cl. 521-164.000.
Montgomery, Warren G. Crossover dump and conveyor advancer. 4,120,390, Cl. 198-309.000.
Mookherjee, Braja Dulal: *See—*
Light, Kenneth K.; Sanders, James Milton; Vock, Manfred Hugo; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja Dulal; Tseng, Ching Y.; and Sprecker, Mark A., 4,120,308, Cl. 131-17.00R.
Moor, Burdette J. Naso-gastric tube holder. 4,120,304, Cl. 128-348.000.
Moore, Carl Orville, to A. E. Staley Manufacturing Company. Aerated confections. 4,120,987, Cl. 426-572.000.
Moran, Paul R.: *See—*
Lasky, Jerome B.; and Moran, Paul R., 4,121,010, Cl. 428-403.000.
Morelock, Charles R.: *See—*
Hillig, William B.; and Morelock, Charles R., 4,120,731, Cl. 106-44.000.
Moreno, Joseph A. Pen for writing a double line. 4,120,595, Cl. 401-35.000.
Morgan, Ronald Wade; and Witherspoon, David Lane. Tape applicator for drapery tabler. 4,120,740, Cl. 156-522.000.
Mori, Yoichi; Ueda, Kanichi; and Takahashi, Masao, to Toray Industries, Inc. Polyurethane spectacle frames or single parts thereof and process for making. 4,120,848, Cl. 528-67.000.
Morimoto, Kazuhisa: *See—*
Hatanaka, Hideo; Murakami, Yoshinobu; and Morimoto, Kazuhisa, 4,120,813, Cl. 252-194.000.
Morimoto, Kiyoshi, to Futaba Denshi Kogyo Kabushiki Kaisha. Method of producing p-n junction type elements by ionized cluster beam deposition and ion-implantation. 4,120,700, Cl. 148-1.500.
Morimoto, Tatsuo; Nakamura, Munekazu; Inooka, Masayoshi; and Yawata, Teizaburo, to Chiyoda Chemical Engineering & Construction Co., Ltd. Catalysts for hydrodemetallization of hydrocarbons containing metallic compounds as impurities and process for hydrotreating such hydrocarbons using such catalysts. 4,120,780, Cl. 208-211.000.
Morita, Akira: *See—*
Kubo, Sueki; Watanabe, Toshiro; Fujita, Masayuki; Matsuno, Tadahiko; and Morita, Akira, 4,120,260, Cl. 118-317.000.
Morita, Hideo: *See—*
Sakurai, Hisaya; Morita, Hideo; Ikegami, Tadashi; Maeda, Katsuaki; and Furusato, Masayasu, 4,120,883, Cl. 260-448.00A.
Morita, Kouji; and Isono, Katsuo, to Sony Corporation. Automatic fine tuning circuit. 4,121,254, Cl. 358-195.000.
Morley, Robert Arthur: *See—*
Kerr, Andrew Guy; and Morley, Robert Arthur, 4,121,293, Cl. 364-463.000.
Mormile, Paul F. Two-stage toilet flushing apparatus. 4,120,055, Cl. 4-324.000.
Morrison, Howard J.: *See—*
Schlau, Floyd E.; and Morrison, Howard J., 4,120,190, Cl. 72-458.000.
Terzian, Rouben T.; Morrison, Howard J.; Schoenfield, Palmer J.; and Kuna, Wayne A., 4,120,117, Cl. 46-130.000.
Morser, Alfred Harold; Gibson, Roy; Szekely, Paul; and Parker, Bruce Trayton, to Cincinnati Milacron Inc. Full-wave bidirectional DC motor drive circuit. 4,121,142, Cl. 318-345.00C.
Morton, Douglas Ross, Jr., to Upjohn Company, The. 13,14-Dihydro-9β-PGD$_2$ compounds. 4,120,879, Cl. 260-408.000.

Morton, Douglas Ross, Jr., to Upjohn Company, The. 9β-PGD$_1$ Compounds. 4,120,880, Cl. 260-408.000.

Morton-Norwich Products, Inc.: *See—*
Wright, George C.; and Butterfield, James L., 4,121,035, Cl. 542-417.000.
Wright, George C.; and Butterfield, James L., 4,121,036, Cl. 542-417.000.

Moschner, Jorg: *See—*
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Motan Gesellschaft mit beschrankter Haftung: *See—*
Haag, Franz; and Bongartz, Paul, 4,120,674, Cl. 55-302.000.

Motooka, Akira; and Yoshida, Takeshi, to Yamato Scale Co. Device of controlling interval of articles on belt conveyer. 4,120,393, Cl. 198-460.000.

Motoren- und Turbinen-Union Friedrichshafen GmbH: *See—*
Deutschmann, Herbert, 4,120,155, Cl. 60-599.000.
Edmaier, Franz, 4,120,271, Cl. 123-41.490.

Motorola, Inc.: *See—*
Alberkrack, Jade Henry; and Hilliker, Stephen Earl, 4,121,162, Cl. 325-421.000.
Baghdadi, Aslan; and Ellis, Ralph J., 4,120,743, Cl. 156-620.000.
Irwin, James Stuart; and Steel, Francis Robert, 4,121,218, Cl. 343-702.000.
Jarrett, Robert Benjamin; Pace, Wilson David; and Weber, Howard Fredrick, 4,121,273, Cl. 361-239.000.

Moughler, Joseph R. Billiard hand bridge. 4,120,495, Cl. 273-23.000.

Moyer, Norman E., to Hughes Aircraft Company. Logic circuit for use in two or three button digital watch. 4,120,148, Cl. 58-85.500.

Mrenna, Stephen A.; and Thomas, Glenn R., to Westinghouse Electric Corp. Circuit breaker having improved movable contact position indicator. 4,121,077, Cl. 200-308.000.

Muckerheide, Myron C., to A. Ward Ford Memorial Institute, Inc. Laser system and method. 4,120,293, Cl. 128-2.00A.

Mueller-Tamm, Heinz; Schick, Hans; Jaggard, James F. R.; and Nickl, Johann, to BASF Aktiengesellschaft. Manufacture of a titanium-containing component for catalysts of the Ziegler-Natta type. 4,120,823, Cl. 252-442.000.

Mufti, Irshad R., to Standard Oil Company (Indiana). Hydrocarbon remote sensing by thermal gradient measurement. 4,120,199, Cl. 73-154.000.

Mulier, Pieter M. J.: *See—*
Jirak, Thomas L.; and Mulier, Pieter M. J., 4,120,307, Cl. 128-419.0PT.

Mullen, John H.: *See—*
Taylor, Glenn R.; Mullen, John H.; and Dobrosielski, Stephen S., 4,121,076, Cl. 200-280.000.

Mullen, Roger F., to General Dynamics Corporation. Forming curved segments from metal plates. 4,120,187, Cl. 72-342.000.

Mullen, Wayne C. Glass cutter apparatus. 4,120,220, Cl. 83-886.000.

Muller, Ernst Willi: *See—*
Wilke, Gunther; and Muller, Ernst Willi, 4,120,882, Cl. 260-439.00R.

Muller, Werner A.; and Abegglen, Hans, to Von Roll AG, Departement Bahn- und Stahlbau. Clamp coupling on a suspension gear of a circular suspension railway. 4,120,247, Cl. 104-208.000.

Murakami, Tetsushi: *See—*
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Murakami, Tomomi, to Citizen Watch Company Limited. Watch module assembly. 4,120,147, Cl. 58-50.00R.

Murakami, Yoshinobu: *See—*
Hatanaka, Hideo; Murakami, Yoshinobu; and Morimoto, Kazuhisa, 4,120,813, Cl. 252-194.000.

Muranka, Eberhard: *See—*
Kuhl, Karl-Heinz; Muranka, Eberhard; Schulz, Bernhard; and Tielens, Asmund, 4,121,189, Cl. 338-226.000.

Murata Manufacturing Co., Ltd.: *See—*
Nishikawa, Toshio; Ito, Yoji; Ishikawa, Youhei; and Tamura, Sadahiro, 4,121,181, Cl. 333-73.00R.

Murphy, Desmond Lewis, to Tektronix, Inc. Programmable attenuator apparatus employing active FET switching. 4,121,183, Cl. 333-81.00R.

Murphy, Richard F.: *See—*
Chierici, Osvaldo F.; and Murphy, Richard F., 4,120,404, Cl. 213-61.000.

Murray, Leo Thomas, to Colgate-Palmolive Company. Washing and bleaching with composition containing bleach activator and a nitrilotricarboxylic acid compound. 4,120,809, Cl. 252-102.000.

Murray, Robert G.; and Gikis, Benjamin J., to Natomas Company. Process and apparatus for separating coarse sand particles and recovering bitumen from tar sands. 4,120,775, Cl. 208-11.00E.

Musgrave, Daniel Dennis. Extended magazine holder. 4,120,109, Cl. 42-90.000.

Mushkin, Nicholas M. Switch. 4,120,115, Cl. 43-137.000.

Mutschler, Steven C.; and Randall, Loane J., to Mutschler, Steven C. Amusement system. 4,120,498, Cl. 273-99.000.

Muz, Edwin, to Siemens Aktiengesellschaft. Plug housing for multipolar plug connectors. 4,120,553, Cl. 339-91.00R.

Myles, Thomas Aquinas, to Carborundum Company, The. Ceramic fiber module attachment system. 4,120,641, Cl. 432-3.000.

N. Greening Limited: *See—*
Hassall, Anthony George, 4,120,784, Cl. 209-399.000.

Naarmann, Herbert: *See—*
Pohlemann, Heinz; Naarmann, Herbert; and Seebach, Dieter, 4,121,027, Cl. 526-29.000.

Nadelson, Jeffrey, to Sandox, Inc. Substituted hydroxy pyridones and their use as minor tranquilizers, sleep inducers and neuroleptics. 4,120,967, Cl. 424-263.000.

Nagai, Hiroshi: *See—*
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Nagami, Masaru: *See—*
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Nagashima, Yukio: *See—*
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Nagler, William M.; and Woosley, Vernon Earl, to Pate Company, The. Pipe flashing unit. 4,120,129, Cl. 52-219.000.

Nagy, Ernest J.: *See—*
Miller, Roy W.; and Nagy, Ernest J., 4,120,412, Cl. 214-63.000.

Nagy, Geza; Pungor, Erno; Toth, Klara; Havas, Jeno; and Feher, Zsofia, to EGYT Gyogyszervegyeszeti Gyar. Process of and equipment for the analysis of liquid samples by titration. 4,120,657, Cl. 23-230.00R.

Nair, Vijay Gopalan; and Bernstein, Seymour, to American Cyanamid Company. Novel 2,2', 2"-[s-phenenyltris(sulfonylimino)tris]-[2-deoxy-α-D-glucopyranose], dodecakis (H-sulfate) compounds and their salts. 4,120,953, Cl. 424-180.000.

Nakabayashi, Katsumi, to Nippon Hoso Kyokai. Sound field expanding device. 4,121,059, Cl. 179-100.1TD.

Nakabe, Ryuhei; Ohta, Yoshio; and Matsuura, Toshiro, to Matsushita Electric Industrial Co., Ltd. Solid state color imaging apparatus. 4,121,244, Cl. 358-44.000.

Nakagawa, Yunosuke: *See—*
Yagi, Kouichi; and Nakagawa, Yunosuke, 4,120,811, Cl. 252-186.000.

Nakagome, Yukio; Teramura, Hiroichi; Yamazaki, Yasuhiro; and Wakahara, Yasushi, to Kokusai Denshin Denwa Kabushiki Kaisha. Method for coding facsimile signal. 4,121,258, Cl. 358-260.000.

Nakaguchi, Kohei; Kawasumi, Shohachi; Hirooka, Masaaki; Yabuuchi, Hiroshi; and Takao, Hiroyoshi, to Sumitomo Chemical Company, Limited. Process for preparing alternating copolymer of conjugated vinyl compound and olefinic unsaturated compound with oxygen and boron compound. 4,121,032, Cl. 526-197.000.

Nakahara, Muneo: *See—*
Komorita, Fujio; and Nakahara, Muneo, 4,120,732, Cl. 106-47.00Q.

Nakajima, Hisao: *See—*
Chinone, Naoki; Kawano, Toshihiro; and Nakajima, Hisao, 4,121,179, Cl. 331-94.50H.

Nakajima, Yasuo; Hayashi, Yoshimasa; and Waku, Makio, to Nissan Motor Company, Limited. Ignition distributor having independent ignition system breaker arm contacts simultaneously engaging common conductive post. 4,121,064, Cl. 200-19.00A.

Nakamura, Kotaro: *See—*
Hara, Hiroshi; and Nakamura, Kotaro, 4,120,723, Cl. 96-74.000.

Nakamura, Munekazu: *See—*
Morimoto, Tatsuo; Nakamura, Munekazu; Inooka, Masayoshi; and Yawata, Teizaburo, 4,120,780, Cl. 208-211.000.

Nakamura, Toshio; Hoshide, Yasuo; Hashimoto, Yoshio; Suzuki, Kenichi; and Yoshida, Yohji, to Nikken Chemicals Co., Ltd. Process for producing 5-fluorouracil derivative with a calcium chloride catalyst. 4,121,037, Cl. 544-313.000.

Nakano, Yoshiyuki: *See—*
Matsumoto, Hiroshi; Nakano, Yoshiyuki; Higashi, Toshihiko; and Yasumoto, Akihiro, 4,120,159, Cl. 60-667.000.

Nakazyo, Kiyoshi; Sakaguchi, Shinji; and Tsuji, Nobuo, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive material. 4,120,725, Cl. 96-97.000.

Nalco Chemical Company: *See—*
Hurlock, John R.; and Ballweber, Edward G., 4,120,840, Cl. 260-29.4UA.

Naono, Toyohiko, to Nihon Denshi Kabishiki Kaisha. Sampling device. 4,120,661, Cl. 422-68.000.

National Carpet Jobbers: *See—*
Alinder, Gilbert L.; and Anderson, Lloyd E., 4,120,463, Cl. 242-56.00R.

National Steel Corporation: *See—*
Saunders, William T., 4,120,419, Cl. 220-66.000.

Natomas Company: *See—*
Murray, Robert G.; and Gikis, Benjamin J., 4,120,775, Cl. 208-11.00E.

Naumenko, Viktor Arsenievich: *See—*
Kocherginsky, Meer Danilovich; Penkova, Lidia Fedorovna; and Naumenko, Viktor Arsenievich, 4,121,018, Cl. 429-27.000.

Nautet, Jean Adolphe: *See—*
Wilmotte, Stephan Hubert; Nautet, Jean Adolphe; and Economopoulos, Marios, 4,120,455, Cl. 239-429.000.

Nawa, Takehiko: *See—*
Numasaki, Kouichi; Sakai, Yoshihisa; Nawa, Takehiko; Matsumoto, Zenji; and Ninomiya, Nobutaka, 4,120,644, Cl. 432-99.000.

NCR Corporation: *See—*
Dev Choudhury, Rathindra N., 4,121,048, Cl. 178-17.00C.
Miller, Robert E.; and Brockett, Bruce W., 4,121,013, Cl. 428-411.000.

Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek ten behoeve van de Rijksverdediging: *See—*
Barendsz, Anton Willem; De Borst, Cornelis; Post, Alfred Johannes Antonius; and Schimmel, Joannes, 4,120,754, Cl. 195-99.000.

Neidermyer, Robert W.: *See*—
Brouwer, Walter G.; MacPherson, Edwin J.; Ames, Ronald B.; Neidermyer, Robert W.; and Crittendon, Charles E., 4,120,861, Cl. 260-302.00D.

Neissel, John P.: *See*—
Terhune, James H.; and Neissel, John P., 4,121,106, Cl. 250-390.000.

Nelson, Norman A., to Upjohn Company, The. 4α,6-Dihydroxy-2α-hydroxy-methyl-3β-tetrahydropyran acetic acid γ lactone derivatives. 4,120,872, Cl. 260-343.600.

Nemirofsky, Frank R. Object-dispensing wearing apparel. 4,120,053, Cl. 2-115.000.

Neuhaus, Hans Ludwig: *See*—
Raasch, Hans; and Neuhaus, Hans Ludwig, 4,120,462, Cl. 242-45.000.

Neumann, Arthur E., to Richard-Allan Medical Industries, Inc. Unit for accommodating disposable bladelike articles. 4,120,397, Cl. 206-370.000.

Neumann, Gernot, to Hanning Elektro-Werke Robert Hanning. Electromechanical adjusting device. 4,120,057, Cl. 5-66.000.

Neumayer, George A. Hollow wall fastener. 4,120,231, Cl. 85-3.00R.

New Nippon Electric Company, Ltd.: *See*—
Asami, Hiroshi; and Kaji, Masao, 4,120,759, Cl. 204-14.00R.

Newlands, Lawrence A. Saddle pillar clamp for bicycle. 4,120,512, Cl. 280-281.00R.

Newman, Seymour: *See*—
Meyer, Fred J.; and Newman, Seymour, 4,120,844, Cl. 260-42.000.

Newman, Thomas A., to McGrath-Hamin, Inc. Finger ring display. 4,120,401, Cl. 206-566.000.

Neyrpic - Creusot Loire: *See*—
Megnint, Lucien, 4,120,602, Cl. 415-1.000.

NGK Insulators, Ltd.: *See*—
Fujita, Hiroshi; and Kato, Kazuhisa, 4,121,046, Cl. 174-141.00R.
Yamada, Mankichi; and Fujita, Hiroshi, 4,121,045, Cl. 174-141.00R.

Ngu Tung, Pham, to Thomson-CSF. Component for logic circuits and logic circuits equipped with this component. 4,121,116, Cl. 307-213.000.

Nichol, Kenneth J.: *See*—
Bristow, Norman W.; Macey, Peter E.; Nichol, Kenneth J.; and Sim, Malcolm F., 4,120,960, Cl. 424-250.000.

Nickl, Johann: *See*—
Mueller-Tamm, Heinz; Schick, Hans; Jaggard, James F. R.; and Nickl, Johann, 4,120,823, Cl. 252-442.000.

Nicolas, Louis: *See*—
Dick, Richard; Feuillade, Georges; Gadessaud, Robert; and Nicolas, Louis, 4,121,022, Cl. 429-204.000.

Nieden, Achim zur, to Klockner-Humboldt-Deutz Aktiengesellschaft. Apparatus for separating gases from liquids. 4,120,673, Cl. 55-205.000.

Niedrach, Leonard W.: *See*—
LeBlanc, Oliver H., Jr.; Niedrach, Leonard W.; and Stoddard, William H., Jr., 4,120,292, Cl. 128-2.00E.

Nielsen, Per Drengsgaard: *See*—
Jensen, Finn Ulrik Hansen; Nielsen, Per Drengsgaard; and Bruhn, Esben, 4,120,713, Cl. 156-72.000.

Nielsen, Steven Thomas, to Beckman Instruments, Inc. Process for making a one piece rotor liner. 4,120,927, Cl. 264-98.000.

Niesel, Harald: *See*—
Kloker, Werner; Bovender, Franz; Gromping, Franz; Goerden, Leonhard; and Niesel, Harald, 4,120,923, Cl. 264-45.300.

Nihon Denshi Kabishiki Kaisha: *See*—
Naono, Toyohiko, 4,120,661, Cl. 422-68.000.

Niina, Yozo. Golf cup with sound producing device. 4,120,496, Cl. 273-34.00R.

Nikken Chemicals Co., Ltd.: *See*—
Nakamura, Toshio; Hoshide, Yasuo; Hashimoto, Yoshio; Suzuki, Kenichi; and Yoshida, Yohji, 4,121,037, Cl. 544-313.000.

Nims, Jerry Curtis: *See*—
Lo, Allen Kwok Wah; and Nims, Jerry Curtis, 4,120,562, Cl. 350-130.000.

Ninomiya, Nobutaka: *See*—
Numasaki, Kouichi; Sakai, Yoshihisa; Nawa, Takehiko; Matsumoto, Zenji; and Ninomiya, Nobutaka, 4,120,644, Cl. 432-99.000.

Nippon Electric Co., Ltd.: *See*—
Matsumoto, Youichi; and Tagashira, Yoshimi, 4,121,166, Cl. 329-122.000.
Ogawa, Takashi; and Kimura, Kazunori, 4,121,197, Cl. 340-166.00R.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Iwamatsu, Masayuki, 4,121,169, Cl. 330-296.000.

Nippon Hoso Kyokai: *See*—
Nakabayashi, Katsumi, 4,121,059, Cl. 179-100.1TD.

Nippon Kokan Kabushiki Kaisha: *See*—
Iizuka, Motohiko; Danjo, Hiroyuki; Ikeda, Kazuo; and Yoshimura, Masatoshi, 4,120,488, Cl. 266-281.000.
Miyauchi, Kohichiroh; Ohsumi, Atsushi; Haga, Yukio; Izumi, Tsutomu; Tsuru, Masahiro; Kunioka, Kazuo; and Sugiyama, Shunichi, 4,120,642, Cl. 432-12.000.

Nippon Paint Co., Ltd.: *See*—
Takahashi, Hiroshi; Hirai, Seizaburo; and Abo, Toshio, 4,120,841, Cl. 260-29.60H.

Nishida, Tadao: *See*—
Terasawa, Shinichi; Okamura, Akitoshi; Okuyama, Shigeru; Nishiyama, Takehiko; and Nishida, Tadao, 4,120,139, Cl. 57-13.000.

Nishikawa, Etsuo: *See*—
Takatori, Osho; Nishikawa, Etsuo; and Fukuyama, Yosinobu, 4,120,251, Cl. 112-121.150.

Nishikawa, Toshio; Ito, Yoji; Ishikawa, Youhei; and Tamura, Sadahiro, to Murata Manufacturing Co., Ltd. Electrical branching filter. 4,121,181, Cl. 333-73.00R.

Nishiyama, Takehiko: *See*—
Terasawa, Shinichi; Okamura, Akitoshi; Okuyama, Shigeru; Nishiyama, Takehiko; and Nishida, Tadao, 4,120,139, Cl. 57-13.000.

Nisley, Donald L., to Reliance Electric Company. Dry fluid drive and rotor therefor. 4,120,388, Cl. 192-105.00A.

Nissan Motor Company, Limited: *See*—
Asano, Masaharu; and Anzai, Makoto, 4,120,270, Cl. 123-32.0EE.
Fujishiro, Takeshi, 4,120,269, Cl. 123-32.0EE.
Iizuka, Akio; Taguchi, Michiichi; and Kubo, Muneyuki, 4,120,821, Cl. 252-432.000.
Kawamoto, Tamio, 4,120,383, Cl. 188-31.000.
Nakajima, Yasuo; Hayashi, Yoshimasa; and Waku, Makio, 4,121,064, Cl. 200-19.00A.
Takamatsu, Yukio; Wakabayashi, Takashi; Noda, Hideyo; Ichikawa, Kiyoshi; Kamegai, Tsuneteru; and Ikawa, Kazuo, 4,120,516, Cl. 280-728.000.
Toda, Yoshio; and Iwasa, Yoshio, 4,120,214, Cl. 74-860.000.
Yokota, Akira, 4,120,154, Cl. 60-282.000.

Nissen, Roland N.; and Flippin, James S., to J. I. Case Company. Mounting arrangement for dozer blade. 4,120,366, Cl. 172-805.000.

Nitro Nobel AB: *See*—
Persson, Per Ingemar, 4,120,439, Cl. 228-107.000.

Noall, Kenneth L.: *See*—
Hone, George D.; Noall, Kenneth L.; and Saunders, Robert L., 4,120,067, Cl. 14-71.500.

Noda, Hideo, to Shimano Industrial Company Limited. Fishing reel. 4,120,465, Cl. 242-84.20A.

Noda, Hideyo: *See*—
Takamatsu, Yukio; Wakabayashi, Takashi; Noda, Hideyo; Ichikawa, Kiyoshi; Kamegai, Tsuneteru; and Ikawa, Kazuo, 4,120,516, Cl. 280-728.000.

Nomura, Toshio; Asai, Tsuyoshi; Yamamoto, Takaharu; and Hara, Akio, to Sumitomo Electric Industries, Ltd. Cemented carbonitride alloys containing tantalum. 4,120,719, Cl. 75-238.000.

Nordblom, George Frederick: *See*—
Turillon, Pierre Paul; Hull, Michael Neill; and Nordblom, George Frederick, 4,121,024, Cl. 429-245.000.

Norris, Alan H.: *See*—
Chambley, Phillip W.; and Norris, Alan H., 4,120,143, Cl. 57-34.0AT.

North American Philips Corporation: *See*—
Ragan, Randall C., 4,121,188, Cl. 338-174.000.

North American Specialties Corporation: *See*—
Seidler, Jack, 4,120,558, Cl. 339-275.00T.

Northrop Corporation: *See*—
Olez, Nejat A., 4,120,998, Cl. 428-33.000.

Norton, Frank E., to Babcock & Wilcox Company, The. Tube support structure. 4,120,350, Cl. 165-162.000.

Novo Industri A/S: *See*—
Henningsen, Bent Aage, 4,120,656, Cl. 422-28.000.

Nowak, Rudolf; and Holland, Gerhard, to Halomet AG. Process for the oxidation of halides. 4,120,941, Cl. 423-592.000.

Nugent, Duane C., to Owens-Illinois, Inc. Modular tubular solar energy collector apparatus. 4,120,285, Cl. 126-271.000.

Numasaki, Kouichi; Sakai, Yoshihisa; Nawa, Takehiko; Matsumoto, Zenji; and Ninomiya, Nobutaka, to JGC Corporation; and Takeda Chemical Industries, Ltd. Apparatus for regeneration of spent active carbon. 4,120,644, Cl. 432-99.000.

Nyhof, Eldon J.: *See*—
De Vries, Martin; Fitzgerald, Harold A., II; Nyhof, Eldon J.; and van Putten, James D., Jr., 4,120,582, Cl. 356-73.000.

Nyman, Bror Goran: *See*—
Hummelstedt, Leif Erik Ingmar; Nyman, Bror Goran; and Leimala, Raimo Juhani, 4,120,817, Cl. 252-364.000.

Occidental Oil Shale, Inc.: *See*—
Ridley, Richard D.; and Burton, Robert S., III, 4,120,354, Cl. 166-251.000.

Ocken, Howard, to Electric Power Research Institute, Inc. Mixed oxide fuel pellet for fuel rod of nuclear reactor core. 4,120,752, Cl. 176-73.000.

Ockwell, Malcolm Charles; McLeod, Patrick Hugh; and Briggs, Peter James, to Matburn (Holdings) Limited. Method of manufacturing a filter for use in venting colostomy or ileostomy appliances. 4,120,715, Cl. 156-252.000.

O'Connor, Gerald. Dipole resonent loop antenna. 4,121,219, Cl. 343-741.000.

O'Connor, Grahame Paul: *See*—
Trojer, Felix; O'Connor, Grahame Paul; and Tannenberger, Helmut, 4,120,730, Cl. 106-39.600.

Ogawa, Hiromichi; Inoue, Kenji; and Fujiwara, Akira, to Matsushita Electric Industrial Co., Ltd. Silver oxide primary cell. 4,121,021, Cl. 429-162.000.

Ogawa, Takashi; and Kimura, Kazunori, to Nippon Electric Co., Ltd. Matrix circuit for an electrostatic recording device comprising cross-point elements for driving each pair of control electrodes on a common matrix conductor. 4,121,197, Cl. 340-166.00R.

Oguino, Masanori: *See*—
Saiki, Yukimi; Oguino, Masanori; and Watanabe, Shutoku, 4,121,252, Cl. 358-169.000.

Ohkura Electric Co., Ltd.: *See*—
Miyazaki, Seiichi, 4,121,118, Cl. 307-262.000.

Ohloff, Gunther: *See*—
Renold, Walter; Skorianetz, Werner; Schulte-Elte, Karl-Heinrich; and Ohloff, Gunther, 4,120,830, Cl. 252-522.000.

Ohmura, Hiroshi; and Kohashi, Akira, to Fuji Photo Film Co., Ltd. Exposure control device for photographic camera. 4,121,230, Cl. 354-21.000.

Ohmura, Kaoru: *See—*
Kobayashi, Hidehiko; Arakawa, Tatsumi; Shiga, Tetsuo; Ohmura, Kaoru; and Ito, Sakae, 4,121,007, Cl. 428-201.000.

Ohokubo, Tadashi: *See—*
Yamaguchi, Masataka; Yamaguchi, Saeko; and Ohokubo, Tadashi, 4,120,079, Cl. 28-282.000.

Ohsawa, Mitsuo, to Sony Corporation. AM receiver. 4,121,161, Cl. 325-404.000.

Ohsawa, Mitsuo, to Sony Corporation. Power supply circuit. 4,121,282, Cl. 363-21.000.

Ohsugi, Motoyoshi: *See—*
Inamoto, Yoshiaki; Aigami, Koji; Ohsugi, Motoyoshi; Ikeda, Hiroshi; and Fujikura, Yoshiaki, 4,120,906, Cl. 260-648.00C.

Ohsumi, Atsushi: *See—*
Miyauchi, Kohichiroh; Ohsumi, Atsushi; Haga, Yukio; Izumi, Tsutomu; Tsuru, Masahiro; Kunioka, Kazuo; and Sugiyama, Shunichi, 4,120,642, Cl. 432-12.000.

Ohta, Mitsunori: *See—*
Watanabe, Koji; Ohta, Mitsunori; and Tomono, Makoto, 4,120,577, Cl. 355-4.000.

Ohta, Takahiro: *See—*
Okamoto, Yoshihiko; and Ohta, Takahiro, 4,120,722, Cl. 96-49.000.

Ohta, Yoshio: *See—*
Nakabe, Ryuhei; Ohta, Yoshio; and Matsuura, Toshiro, 4,121,244, Cl. 358-44.000.

Ohuchi, Yoshio: *See—*
Omori, Hideyuki; Otubo, Osamubo; and Ohuchi, Yoshio, 4,121,223, Cl. 346-75.000.

Okamoto, Nobukazu, to Toa Nenryo Kogyo Kabushiki Kaisha. Lubricating oil additive, process for the synthesis thereof and lubricating oil additive composition. 4,120,887, Cl. 260-462.00R.

Okamoto, Yoshihiko; and Ohta, Takahiro, to Fuji Photo Film Co., Ltd. Thermal development of imaged light-sensitive recording material using microwaves. 4,120,722, Cl. 96-49.000.

Okamura, Akitoshi: *See—*
Terasawa, Shinichi; Okamura, Akitoshi; Okuyama, Shigeru; Nishiyama, Takehiko; and Nishida, Tadao, 4,120,139, Cl. 57-13.000.

Okumura, Takuzo: *See—*
Fukushima, Nobuo; Uemura, Yukikazu; Okumura, Takuzo; and Hayashida, Haruo, 4,120,931, Cl. 264-288.000.

Okuyama, Shigeru: *See—*
Terasawa, Shinichi; Okamura, Akitoshi; Okuyama, Shigeru; Nishiyama, Takehiko; and Nishida, Tadao, 4,120,139, Cl. 57-13.000.

Olez, Nejat A., to Northrop Corporation. Composite structure. 4,120,998, Cl. 428-33.000.

Olin Corporation: *See—*
Kadija, Igor V., 4,120,772, Cl. 204-252.000.
Kleine, Charles A.; and Middleton, Verne L., 4,120,351, Cl. 165-170.000.
Schaffling, Otto G., 4,120,153, Cl. 60-255.000.

Oloff, Clarence M.; Karl, Alva A.; Wolff, Walter M.; Halbrook, Lloyd W.; Brown, Ray D.; and Dickey, Raymond G., to United States of America, Air Force. Subhuman primate restraint system. 4,120,266, Cl. 119-103.000.

Olson, Arthur Barnhart, to Control Data Corporation. Rotating spindle and stationary transducer device for sensing the preferred magnetically permeable orientation in magnetic media. 4,121,156, Cl. 324-210.000.

Omori, Hideyuki; Otubo, Osamubo; and Ohuchi, Yoshio, to Hitachi, Ltd. Ink jet recording apparatus with an improved ink sensor. 4,121,223, Cl. 346-75.000.

O'Neil, Charles P., to Amerace Corporation. Timing device for a fluid signal and fluid actuator therefor. 4,120,321, Cl. 137-271.000.

Onizuka, Koji: *See—*
Taniguchi, Taizo; Iwasaki, Itsutoshi; Takeshige, Toshihiko; Onizuka, Koji; and Hashiguchi, Soichi, 4,120,734, Cl. 106-67.000.

Opie, William R.: *See—*
Coffin, Lamar D.; and Opie, William R., 4,120,697, Cl. 75-72.000.

Optel Corporation: *See—*
Deb, Satyendra Kumar; and Witzke, Horst, 4,120,568, Cl. 350-357.000.

Orcutt, John W.; and Mills, James M., to Texas Instruments Incorporated. Condition responsive apparatus with motion transfer member to movable contact arm. 4,121,074, Cl. 200-83.00P.

Orcutt, John W.: *See—*
Bileski, Thomas; Crawford, Joe W.; Blanton, Bobby D.; Johnson, Carl N.; Garcia, Felix; Orcutt, John W.; Shepherd, Glen C.; and Oursler, James A., 4,121,073, Cl. 200-83.00P.

Ormonde, Stephan M.: *See—*
Golden, David E.; and Ormonde, Stephan M., 4,121,176, Cl. 331-94.50G.

Ornstein, Leonard; Williams, Hazel Elizabeth; and Intraub, Julius, to Technicon Instruments Corporation. Process for mounting tissue sections with an U.V. light curable mounting medium. 4,120,991, Cl. 427-2.000.

Orr, Thomas Samuel Campbell; and Kingsley, Patrick John, to Fisons Limited. Method of psychiatric conditions. 4,120,975, Cl. 424-283.000.

Osawa, Sadao: *See—*
Yamashita, Hiroshi; Osawa, Sadao; Saida, Takashi; and Sakasai, Yutaka, 4,120,805, Cl. 252-62.10L.

Ota, Kyozo, to Keio Giken Kogyo Kabushiki Kaisha. Electronic tuner. 4,120,229, Cl. 84-454.000.

Ota, Toshihiko: *See—*
Furukawa, Kaoru; Matsunami, Koichi; Ota, Toshihiko; Murakami, Tetsushi; Nagai, Hiroshi; and Tamaki, Kazuo, 4,120,928, Cl. 264-171.000.

Otteblad, Sven Ivar Arne; Brelen, Hans Erik Osborn; Wistrand, Per Folke Magnus; and Samuelson, Svante Ragnar, to AB Volvo. Foot-operated device for controlling engine power and braking effect in motor vehicles. 4,120,387, Cl. 192-3.00S.

Otten, Geneva Gail, to Proctor & Gamble Company, The. Method of increasing sucrose yield of sugarcane. 4,120,688, Cl. 71-86.000.

Otto, Paul R.; and Leang, William N. C., to Westinghouse Electric Corp. Elevator system. 4,120,381, Cl. 187-29.00R.

Otubo, Osamubo: *See—*
Omori, Hideyuki; Otubo, Osamubo; and Ohuchi, Yoshio, 4,121,223, Cl. 346-75.000.

Ouchi Shinko Kagaku Kogyo Kabushiki Kaisha: *See—*
Torii, Sigeru; Tanaka, Hideo; and Mishima, Kiyoshi, 4,120,764, Cl. 204-78.000.

Oursler, James A.: *See—*
Bileski, Thomas; Crawford, Joe W.; Blanton, Bobby D.; Johnson, Carl N.; Garcia, Felix; Orcutt, John W.; Shepherd, Glen C.; and Oursler, James A., 4,121,073, Cl. 200-83.00P.

Outokumpu Oy: *See—*
Hummelstedt, Leif Erik Ingmar; Nyman, Bror Goran; and Leimala, Raimo Juhani, 4,120,817, Cl. 252-364.000.

Ovalstrapping, Inc.: *See—*
Pasic, James A.; and Berg, Marvin I., 4,120,239, Cl. 100-26.000.

Overacker, James Leroy: *See—*
Christian, John Hunt; and Overacker, James Leroy, 4,120,629, Cl. 425-135.000.

Overhead Door Corporation: *See—*
Jones, Melvin L., 4,121,140, Cl. 318-221.00R.

Overton, Arthur W.: *See—*
Campbell, Dudley H.; and Overton, Arthur W., 4,121,071, Cl. 200-67.00G.

Owens-Corning Fiberglas Corporation: *See—*
Fly, James Alan; and Slonaker, Robert O., 4,120,191, Cl. 73-9.000.

Owens-Illinois, Inc.: *See—*
Bieringer, Robert J.; and Ringlien, James A., 4,120,590, Cl. 356-161.000.
Byrum, Bernard W., Jr.; Ernsthausen, Roger E.; and Fein, Michael E., 4,120,808, Cl. 252-63.200.
Ernsthausen, Roger E., 4,121,133, Cl. 313-518.000.
Francel, Josef; King, James E.; and Woulbroun, John M., 4,120,678, Cl. 65-32.000.
Irwin, George W., 4,120,683, Cl. 65-207.000.
Mallory, James D.; Fleck, John F.; and Cuniberti, Mario, 4,120,684, Cl. 65-302.000.
Nugent, Duane C., 4,120,285, Cl. 126-271.000.

P.F.W. Beheer B.V.: *See—*
van den Bosch, Steven, 4,120,985, Cl. 426-535.000.

Pacciarini, Antonio: *See—*
Colombani, Bruno; and Pacciarini, Antonio, 4,120,714, Cl. 156-131.000.

Pace, Wilson David: *See—*
Jarrett, Robert Benjamin; Pace, Wilson David; and Weber, Howard Fredrick, 4,121,273, Cl. 361-239.000.

Pahl, Karl Heinz, to Pahl'sche Gummi- und Asbestgesellschaft Paguag. High pressure hose composed of elastomers and embedded reinforcements. 4,120,324, Cl. 138-137.000.

Pahl'sche Gummi- und Asbestgesellschaft Paguag: *See—*
Pahl, Karl Heinz, 4,120,324, Cl. 138-137.000.

Pak, Ivan Timofeevich: *See—*
Akushsky, Izrail Yakovlevich; Burtsev, Vladimir Mikhailovich; Duisenov, Bulat Esenovich; Pak, Ivan Timofeevich; and Zhautykov, Anurbek Orymbekovich, 4,121,298, Cl. 364-746.000.

Palitex Project Company GmbH: *See—*
Franzen, Gustav, 4,120,142, Cl. 57-34.00R.

Palme, Christl: *See—*
Jagoutz, Emil; and Palme, Christl, 4,121,098, Cl. 250-273.000.

Palmer, Charles E. Noise control enclosure. 4,120,376, Cl. 181-204.000.

Palmer, David A. Paint remover with improved safety characteristics. 4,120,810, Cl. 252-153.000.

Pamplin, John Warner; Bennett, James Vine; and Elson, Peter Fred, to Marshall Richards Barcro Limited. Multi-die/block drawing machines. 4,120,186, Cl. 72-278.000.

Papukova, Klavdia Pavlovna: *See—*
Kuznetsova, Nadezhda Nikolaevna; Samsonov, Georgy Vasilievich; Papukova, Klavdia Pavlovna; Bilibina, Galina Vladimirovna; Shataeva, Larisa Konstantinovna; Selezneva, Aida Alexandrovna; Kuznetsova, Nina Petrovna; Vitols, Oyar Ansovich; Shtrausa, Anite Ansovna; Gudkin, Lev Romanovich; Mishaeva, Rimma Nikodimovna; and Rozhetskaya, Karina Moiseevna, 4,120,831, Cl. 521-38.000.

Parker, Bruce Trayton: *See—*
Morser, Alfred Harold; Gibson, Roy; Szekely, Paul; and Parker, Bruce Trayton, 4,121,142, Cl. 318-345.00C.

Parker-Hannifin Corporation: *See—*
Bourassa, Joseph R.; and Lopez, Manuel, 4,120,476, Cl. 248-486.000.
Sharp, Bernard C.; and Petrik, John T., 4,120,069, Cl. 15-250.320.

Parkinson, David B.; and Parkinson, Truman D., to Gould Inc. Battery plate and methods of manufacture. 4,121,023, Cl. 429-211.000.

Parkinson, Truman D.: *See—*
Parkinson, David B.; and Parkinson, Truman D., 4,121,023, Cl. 429-211.000.

Parmann, Gunnar, to Rieber & Son Plastic-Industri A/S. Combined mould element and sealing ring. 4,120,521, Cl. 285-113.000.
Parthasarathy, R.; and Hort, Eugene Victor, to GAF Corporation. Process for producing an unsaturated glycol diester using a catalyst comprising palladium containing thorium as a promotor. 4,121,039, Cl. 560-244.000.
Partlow Corporation: *See*—
Wargo, Thomas J., 4,120,201, Cl. 73-361.000.
Pasic, James A.; and Berg, Marvin I., to Ovalstrapping, Inc. Strapping machine. 4,120,239, Cl. 100-26.000.
Pate Company, The: *See*—
Nagler, William M.; and Woosley, Vernon Earl, 4,120,129, Cl. 52-219.000.
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Stupak, Leonid Mikhailovich; Baglai, Viktor Mikhailovich; Bogachenko, Alexei Georgievich; Kazakov, Sergei Sergeevich; and Tsykulenko, Anatoly Konstantinovich. Process of the electroslag remelting of consumable electrodes. 4,120,695, Cl. 75-10.00C.
Paton, John Stewart; and Shaw, Alexander, to Greater Glasgow Health Board. Ultrasonic scanning apparatus. 4,120,291, Cl. 128-2.00V.
Pauls, Mathias, to Artur Fischer Forschung. Arrangement for securing objects to support structures with multi-component hardenable binder material. 4,120,128, Cl. 52-173.00R.
Paulus, Wilfried; and Genth, Hermann, to Bayer Aktiengesellschaft. Composition for combating slimes. 4,120,686, Cl. 71-67.000.
Paust, Joachim: *See*—
Jaedicke, Hagen; and Paust, Joachim, 4,120,868, Cl. 260-340.700.
Pauwels, Willy Lodewijk: *See*—
Peeters, Emiel Adriaan; and Pauwels, Willy Lodewijk, 4,120,739, Cl. 156-506.000.
Payne, Thomas R.; James, Harry K.; and Judy, Millard M., to Texas Instruments Incorporated. Method of fabricating a thermal display device. 4,120,744, Cl. 156-653.000.
Pearce, Ronald: *See*—
Candlin, John Paton; Wilson, Keith Collier; and Pearce, Ronald, 4,121,030, Cl. 526-119.000.
Pechhold, Engelbert, to Du Pont de Nemours, E. I., and Company. Polyether urethane polymers prepared from a copolymer of tetrahydrofuran and ethylene oxide. 4,120,850, Cl. 528-66.000.
Peck, Vincent W., to TRW Inc. Polarity reversing electrical switch. 4,121,068, Cl. 200-67.00G.
Peeters, Emiel Adriaan; and Pauwels, Willy Lodewijk, to Agfa-Gevaert, N.V. Butt splicer for butt-joining a fresh web to a progressing web. 4,120,739, Cl. 156-506.000.
Pendleton, Darrell D.: *See*—
Greene, Pliney O., Jr.; and Pendleton, Darrell D., 4,120,543, Cl. 308-233.000.
Penkova, Lidia Fedorovna: *See*—
Kocherginsky, Meer Danilovich; Penkova, Lidia Fedorovna; and Naumenko, Viktor Arsenievich, 4,121,018, Cl. 429-27.000.
Penner, Peter P. Book holding apparatus. 4,120,475, Cl. 248-451.000.
Pennsylvania Sewing Research Corp.: *See*—
Glassman, Aaron, 4,120,252, Cl. 112-143.000.
Perepelkin, Vitaly Petrovich: *See*—
Auslender, Vadim Leonidovich; Budker, Gersh Itskovich; Glagolev, Georgy Borisovich; Livshits, Anatoly Alexandrovich; Perepelkin, Vitaly Petrovich; Polyakov, Vladimir Arkhipovich; Chepel, Lev Vladimirovich; Chertok, Ilya Lvovich; and Cheskidov, Vladimir Georgievich, 4,121,086, Cl. 219-121.0EM.
Perkin-Elmer Corporation, The: *See*—
Talmadge, Paul Conway, 4,121,145, Cl. 318-696.000.
Perkins, Thomas K., to Atlantic Richfield Company. Wellhead seal. 4,120,506, Cl. 277-105.000.
Perry, Jerry L.: *See*—
Bunch, Carroll S.; Perry, Jerry L.; and Marcucci, Robert L., 4,121,216, Cl. 343-113.00R.
Persson, Per Ingemar, to Nitro Nobel AB. Method for welding by explosion of powder material on a firm surface. 4,120,439, Cl. 228-107.000.
Peter, Anthony E.: *See*—
Ameen, Joseph G.; Elmore, Glenn V.; and Peter, Anthony E., 4,120,843, Cl. 260-33.80R.
Peters, Howard M.; and Simon, Robert L., Jr., to United States of America, Energy. Nitroaliphatic difluoroformals. 4,120,710, Cl. 149-88.000.
Petersen, George E.; and Dotson, James M., to General Electric Company. Separation of mixed ion exchange resins. 4,120,786, Cl. 209-454.000.
Peterson, Charles A., to Westinghouse Electric Corp. Series capacitor system with force firing of protective bypass device. 4,121,270, Cl. 361-54.000.
Peterson, Robert K., to Texas Instruments Incorporated. Beam type planar array antenna method of fabrication. 4,120,085, Cl. 29-600.000.
Petrie, Edward M., to Westinghouse Electric Corp. Epoxy-amine adhesive compositions. 4,120,913, Cl. 260-830.0TW.
Petrik, John T.: *See*—
Sharp, Bernard C.; and Petrik, John T., 4,120,069, Cl. 15-250.320.
Petrik, Lidia Ivanovna: *See*—
Liverant, Vladimir Leibovich; Yagupolsky, Lev Moiseevich; Ilichenko, Andrei Yakovlevich; Timashpolskaya, Faina Borisovna; Fedorovskaya, Elena Alexeevna; Petrik, Lidia Ivanovna; Kalantarov, Iosif Yakubovich; Kopylova, Mira Semenovna; and Meitus, Idima Evgenievna, 4,120,855, Cl. 260-153.000.
Petrolite Corporation: *See*—
Cheng, William J.; and Guthrie, David B., 4,121,026, Cl. 526-15.000.
Quinlan, Patrick M.; and McBride, Richard D., 4,120,654, Cl. 422-16.000.
Pezzoli, Silvestro: *See*—
Vargiu, Silvio; Mazzoleni, Giorgio; and Pezzoli, Silvestro, 4,120,685, Cl. 71-30.000.
Pfaelzer, Peter. Measuring device for spaghetti or the like. 4,120,094, Cl. 33-174.00T.
Pfiffner, Albert: *See*—
Frater, Georg; Pfiffner, Albert; Suchy, Milos; and Zurfluh, Rene, 4,120,974, Cl. 424-278.000.
Pfizer Inc.: *See*—
Althuis, Thomas H.; Czuba, Leonard J.; Hess, Hans-Jurgen E.; and Kadin, Saul B., 4,120,962, Cl. 424-251.000.
Barth, Wayne E., 4,121,040, Cl. 544-28.000.
Phelps, Paul S. Key-lock knife. 4,120,088, Cl. 30-160.000.
Philibert, Daniel, to Saint-Gobain Industries. Production of semi-reflecting glass products. 4,120,679, Cl. 65-60.00B.
Philipsen, R. Dale, to Caterpillar Tractor Co. Forward-reverse interlock for a transmission. 4,120,212, Cl. 74-476.000.
Phillips, Nolan B.: *See*—
Braswell, James L.; Covington, Cecil E.; Phillips, Nolan B.; and Snyder, David E., 4,120,610, Cl. 416-226.000.
Phillips Petroleum Company: *See*—
Fahey, Darryl R.; and Mahan, John E., 4,120,907, Cl. 260-666.00B.
Fodor, Lawrence M.; and Kitchen, Alonzo G., 4,120,915, Cl. 260-880.00B.
Irvin, Howard B.; and Sherk, Fred T., 4,121,029, Cl. 526-64.000.
Kubicek, Donald H., 4,120,944, Cl. 423-416.000.
LaSpisa, Ronald J.; and Giles, Richard F., 4,120,630, Cl. 425-142.000.
Meister, John J., 4,120,356, Cl. 166-267.000.
Threlkeld, Curtis B.; Hessert, James E.; and Clampitt, Richard L., 4,120,361, Cl. 166-294.000.
Tinker, Donald; and Berg, Keith E., 4,120,790, Cl. 210-65.000.
Wu, Yulin, 4,120,902, Cl. 260-586.00R.
Phipps, Peter Beverley; Sharma, Bhim Sain; and Wu, Anthony Wai, to International Business Machines Corporation. Process for bonding a durable low surface energy coating. 4,120,995, Cl. 427-248.00A.
Phripp, Clarence F.; and Preston, Norman R. Flush toilet accessory. 4,120,056, Cl. 4-324.000.
Pick, George G.: *See*—
Cowe, Alan B.; Kubinak, Ronald A.; Pick, George G.; Flanagan, Richard M.; and Szabo, Francis S., 4,121,228, Cl. 354-7.000.
Pierce, Bill L., to United States of America, Energy. Heat transport system. 4,120,172, Cl. 62-115.000.
Pierre, Kenneth J.; and Tung, Ker-Kong, to Beckman Instruments, Inc. Kinetic method for determination of glucose concentrations with glucose dehydrogenase. 4,120,755, Cl. 195-103.50C.
Pikul, Richard E., to Puritan Bennett Corporation. Oil sealed single stage vacuum pump. 4,120,621, Cl. 418-99.000.
Pilgrim Engineering Developments Limited: *See*—
Bunyan, Thomas Walter, 4,120,230, Cl. 85-1.00T.
Pilipovich, Donald; Grant, Louis R., Jr.; and Wilson, Richard D., to United States of America, Air Force. Synthesis of fluorotrinitromethane. 4,120,904, Cl. 260-644.000.
Pilkington Brothers Limited: *See*—
Cross, Raymond Peter, 4,120,680, Cl. 65-114.000.
Cross, Raymond Peter; and Thomas, Derek Edward, 4,120,681, Cl. 65-114.000.
Pillsbury Company, The: *See*—
Richardson, Donald G.; and Hans, Richard G., 4,120,984, Cl. 426-412.000.
Pircon, Ladislav J. Pollution control apparatus and method. 4,120,670, Cl. 55-90.000.
Pivette, Pierre: *See*—
Crambes, Michel; Grangette, Henri; Pivette, Pierre; and Haicour, Philippe, 4,120,655, Cl. 422-15.000.
Place, Harry, to International Telephone & Telegraph Corporation. Speech synthesizer. 4,121,051, Cl. 179-1.0SM.
Plant, Howard L.; Zukel, John W.; and Ames, Ronald B., to Uniroyal, Inc. Thio pyridine N-oxides and regulation of the natural growth and development of plants therewith. 4,120,692, Cl. 71-94.000.
Plant, Jeffrey N.: *See*—
Price, G. Richard; and Plant, Jeffrey N., 4,120,547, Cl. 312-209.000.
Platzer, Hubert, to Dipl.-Ing. Hitzinger & Co. Brushless synchronous generator system. 4,121,148, Cl. 322-59.000.
Pless, Janos: *See*—
Bauer, Wilfried; and Pless, Janos, 4,120,852, Cl. 260-112.50S.
Plessey Handel und Investments AG: *See*—
Venton, Peter Charles; Blench, Michael; Sutherland, Anthony Keith; and Hodges, Kenneth James Hamer, 4,121,286, Cl. 364-200.000.
Plotkin, George Michael: *See*—
Rhoads, Kevin George; and Plotkin, George Michael, 4,120,305, Cl. 128-405.000.
Pluss, Kurt; and De Martin, Bruno Romano, to Cilag-Chemie A.G. (N-Substituted-pyridyl)-alkyl sulfonic acid betaines as electroplating additives. 4,120,859, Cl. 260-294.80R.
Pohlemann, Heinz; Naarmann, Herbert; and Seebach, Dieter, to BASF Aktiengesellschaft. Polymerization initiators containing thio bridges. 4,121,027, Cl. 526-29.000.
Pohlig-Heckel-Bleichert Vereinigte Maschinen-Fabriken: *See*—
Gehring, Karl; and Kamm, Kurt, 4,120,408, Cl. 214-10.000.
Pohlke, Rolf: *See*—
Seubert, Jurgen; Pohlke, Rolf; Thomas, Herbert; and Andrews, Peter, 4,120,961, Cl. 424-250.000.

Pokrandt, Kurt. Current sensing circuitry. 4,121,122, Cl. 307-362.000.

Polaroid Corporation: *See—*
Fitzgerald, Maurice J., 4,120,727, Cl. 96-114.000.
Hudspeth, William, 4,121,233, Cl. 354-150.000.

Poletto, John Frank; and Bernstein, Seymour, to American Cyanamid Company. Ureylene naphthalene sulfonic acids. 4,120,891, Cl. 260-506.000.

Poletto, John Frank; Conrow, Ransom Brown; and Bernstein, Seymour, to American Cyanamid Company. Anionic naphthalene thioureido naphthalene sulfonic acids. 4,120,892, Cl. 260-506.000.

Poletto, John Frank; Conrow, Ransom Brown; and Bernstein, Seymour, to American Cyanamid Company. Anionic naphthalene thioureido toluenesulfonic acids. 4,120,893, Cl. 260-506.000.

Poletto, John Frank: *See—*
Conrow, Ransom Brown; Poletto, John Frank; and Bernstein, Seymour, 4,120,895, Cl. 562-457.000.

Polyakov, Vladimir Arkhipovich: *See—*
Auslender, Vadim Leonidovich; Budker, Gersh Itskovich; Glagolev, Georgy Borisovich; Livshits, Anatoly Alexandrovich; Perepelkin, Vitaly Petrovich; Polyakov, Vladimir Arkhipovich; Chepel, Lev Vladimirovich; Chertok, Ilya Lvovich; and Cheskidov, Vladimir Georgievich, 4,121,086, Cl. 219-121.0EM.

Popkin, Philip, to Martin Marietta Corporation. Regenerative line access module. 4,121,054, Cl. 179-15.0BD.

Popper's Choice Company, The: *See—*
Blomberg, James K., 4,120,236, Cl. 99-323.900.

Porchey, David V.: *See—*
Starks, Charles M.; Jackson, Robert G.; Porchey, David V.; and Royer, Dennis J., 4,120,881, Cl. 260-449.60R.

Portesi, Peter J.: *See—*
Drake, Jerry W.; and Portesi, Peter J., 4,121,241, Cl. 357-71.000.

Post, Alfred Johannes Antonius: *See—*
Barendsz, Anton Willem; De Borst, Cornelis; Post, Alfred Johannes Antonius; and Schimmel, Joannes, 4,120,754, Cl. 195-99.000.

Potomac Applied Mechanics, Inc.: *See—*
Stubbings, James H., 4,120,181, Cl. 70-58.000.

Potter, Jerry Fuller, to Du Pont de Nemours, E. I., and Company. Staple length cutter with low noise level jet to assist in doffing cut staple. 4,120,222, Cl. 83-99.000.

Poty, Andre: *See—*
Michel, Edmond; Duikers, Marcel; and Poty, Andre, 4,120,634, Cl. 425-525.000.

Pouderoux, Pierre, to Stein Industrie S.A. Heat exchanger having a plurality of modules connected in parallel. 4,120,348, Cl. 165-81.000.

PPG Industries, Inc.: *See—*
Castellucci, Nicholas T., 4,120,996, Cl. 427-318.000.
Rinehart, Jay Kent, 4,120,886, Cl. 260-455.00A.
Shaffer, Paul E., 4,121,014, Cl. 428-412.000.

Prenn, Otto E., to Steel Company of Canada Limited, The. Composite electrode with non-consumable upper section. 4,121,042, Cl. 13-18.00R.

Pressmaster, Ltd.: *See—*
Undin, Hans, 4,121,092, Cl. 219-501.000.

Preston, Norman R.: *See—*
Phripp, Clarence F.; and Preston, Norman R., 4,120,056, Cl. 4-324.000.

Prestridge, Floyd Leon, to Combustion Engineering, Inc. Process for mixing and separation in a solvent extraction system. 4,120,769, Cl. 204-186.000.

Preuss, Dieter; and Segin, Peter, to Dr.-Ing. Rudolf Hell GmbH. Method for digital run-length coding with redundance reduction for transmission of binarily coded picture informations. 4,121,259, Cl. 358-261.000.

Price, Arthur B., to Singer Company, The. Method and apparatus for control signal separation to regain synchronization between a visual image projector and an audio program. 4,121,263, Cl. 360-27.000.

Price, G. Richard; and Plant, Jeffrey N., to United States of America, Army. Dissecting tray. 4,120,547, Cl. 312-209.000.

Primary Design Group, Inc.: *See—*
Kotyuk, Bernard, 4,120,400, Cl. 206-528.000.

Prinz, Francois, to Heuer-Leonidas S.A. Pulsimeter. 4,120,296, Cl. 128-2.05T.

Probst, Karl: *See—*
Schafer, Anton; Probst, Karl; and Hufken, Kurt, 4,120,238, Cl. 100-11.000.

Procter & Gamble Company, The: *See—*
Dirksing, Robert S., 4,120,420, Cl. 220-416.000.
Sarge, Henry David, III; and Kleinschmidt, David Charles, 4,120,747, Cl. 162-117.000.
Seiden, Paul, 4,120,990, Cl. 426-601.000.
Shelton, David Lee, 4,120,948, Cl. 424-66.000.

Proctor & Gamble Company, The: *See—*
Otten, Geneva Gail, 4,120,688, Cl. 71-86.000.

Propst, Paul L.: *See—*
Propst, Robert L.; and Propst, Paul L., 4,120,422, Cl. 221-88.000.

Propst, Robert L.; and Propst, Paul L., to Herman Miller, Inc. System for storing and transporting flat board-like elements. 4,120,422, Cl. 221-88.000.

Prost, Roger, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Containers for cryogenic liquids. 4,120,421, Cl. 220-423.000.

Pruckmayr, Gerfried; and Weir, Robert H., to Du Pont de Nemours, E. I., and Company. Method for preparing poly(tetramethylene ether) glycol. 4,120,903, Cl. 260-615.00B.

Puglisi, Vincent J.: *See—*
Seiger, Harvey N.; and Puglisi, Vincent J., 4,120,757, Cl. 204-2.100.

Pullman Incorporated: *See—*
Fraley, Lowell David, 4,120,668, Cl. 55-72.000.
Miller, Roy W.; and Nagy, Ernest J., 4,120,412, Cl. 214-63.000.

Pungor, Erno: *See—*
Nagy, Geza; Pungor, Erno; Toth, Klara; Havas, Jeno; and Feher, Zsofia, 4,120,657, Cl. 23-230.00R.

Puritan Bennett Corporation: *See—*
Pikul, Richard E., 4,120,621, Cl. 418-99.000.

Purvis, Marshall T.; and Grant, R. Peter, to Rohm and Haas Company. Modifiers for PVC foam, process for extruding modified PVC foam and modified PVC foam compositions. 4,120,833, Cl. 921-81.000.

Purvis, Michael J.: *See—*
Krechel, Joseph L.; and Purvis, Michael J., 4,120,319, Cl. 137-583.000.

Puschkarski, Felix. Clamping device. 4,120,130, Cl. 52-285.000.

Putt, J. William. Magnetic apparatus for producing movement. 4,121,139, Cl. 318-134.000.

Pye, David S.: *See—*
Fischer, Paul W.; Pye, David S.; and Gallus, Julius P., 4,120,369, Cl. 175-72.000.

Quell, Peter: *See—*
Forster, Siegfried; Quell, Peter; and Sack, Berthold, 4,120,750, Cl. 176-60.000.

Queuille, Andre; and Herbemont, Francoise. Pharmaceutical compositions for barium opacification and method of preparing them. 4,120,946, Cl. 424-4.000.

Quigley, Richard E., Jr., to United States of America, Air Force. Solid propellant pressurization of monopropellant fuel powered system. 4,120,151, Cl. 60-39.46M.

Quinlan, Patrick M.; and McBride, Richard D., to Petrolite Corporation. Alkynoxymethyl amines as corrosion inhibitors. 4,120,654, Cl. 422-16.000.

Raasch, Hans; and Grecksch, Hans, to W. Schlafhorst & Co. Method and device for joining a thread. 4,120,140, Cl. 57-34.00R.

Raasch, Hans; and Neuhaus, Hans Ludwig, to W. Schlafhorst & Co. Method and device for controlling and/or regulating thread tension during winding of a textile coil. 4,120,462, Cl. 242-45.000.

Rabindran, George: *See—*
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Rabischong, Pierre; and Bel, Jean-Pierre L., to Institut National de la Sante Et de la Recherche Medicale. Orthopedic corset. 4,120,297, Cl. 128-78.000.

Rabl, Arnulf; and Rabl, Veronika, to United States of America, Energy. Prisms with total internal reflection as solar reflectors. 4,120,565, Cl. 350-286.000.

Rabl, Veronika: *See—*
Rabl, Arnulf; and Rabl, Veronika, 4,120,565, Cl. 350-286.000.

Ragan, Randall C., to North American Philips Corporation. Closed frame single turn potentiometer with helical coil spring wiper adjustable through substrate. 4,121,188, Cl. 338-174.000.

Rainville Company, Inc.: *See—*
Rainville, Dewey, 4,120,924, Cl. 264-45.500.

Rainville, Dewey, to Rainville Company, Inc. Method for making foamed blown ware. 4,120,924, Cl. 264-45.500.

Ralston Purina Company: *See—*
Cosma, Earl Jesse; and Tuley, William Bayard, 4,121,300, Cl. 366-251.000.
Hahn, David T., 4,120,988, Cl. 426-573.000.

Raman, Manjeri S., to Calgon Corporation. Polymeric demulsifiers. 4,120,815, Cl. 252-341.000.

Randall, Loane J.: *See—*
Mutschler, Steven C.; and Randall, Loane J., 4,120,498, Cl. 273-99.000.

Rangaire Corporation: *See—*
Bowen, Leon O., Jr.; and McVean, Michael T., 4,120,290, Cl. 126-299.00D.

Range, Richard J.; and Soodak, Charles I., to Baxter Travenol Laboratories, Inc. Positive displacement pump. 4,120,202, Cl. 73-421.00R.

Rappinger, Bo Vesteras, to Asea Aktiebolag. Preheating metallurgical enclosures. 4,121,043, Cl. 13-34.000.

Rasins, Janis A.: *See—*
Dwyer, Niles M.; and Rasins, Janis A., 4,120,616, Cl. 417-373.000.

Rauffer, Walter: *See—*
Hofmann, Wilfried; Lueder, Guenther; Rauffer, Walter; Krueger, John; and Koopmann, Adolf, 4,120,574, Cl. 353-27.00R.

Rawls, William W.: *See—*
Stascavage, John A.; Rawls, William W.; and Buchholz, Alexander, 4,120,340, Cl. 160-133.000.

Raychem Corporation: *See—*
Glover, Leon C.; and Lopez, Eugene F., 4,121,011, Cl. 428-347.000.
Gotcher, Alan J.; Germeraad, Paul B.; and Jansons, Viktors, 4,121,001, Cl. 428-35.000.

Raymond Lee Organization, Inc., The: *See—*
Burch, Delwin L., 4,120,436, Cl. 224-42.10C.
Donaldson, Robert G., 4,121,061, Cl. 179-156.00R.
Martin, William H., 4,120,502, Cl. 273-176.00R.
Mecherlen, Otto, 4,120,237, Cl. 99-340.000.
Veigel, Orin C., 4,120,546, Cl. 312-134.000.
Wilson, Gene W., 4,120,259, Cl. 116-124.00B.

Raytheon Company: *See—*
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Meadows, Lee A., 4,121,221, Cl. 343-854.000.
Roeber, Frederick W., 4,121,049, Cl. 178-18.000.

RCA Corporation: *See—*
Credelle, Thomas Lloyd, 4,121,137, Cl. 315-366.000.

Cusack, Joseph Martin, 4,121,211, Cl. 343-14.000.
Gange, Robert Allen, 4,121,130, Cl. 313-302.000.
Goodman, Lawrence Alan; Levine, Aaron William; and Meyerhofer, Dietrich, 4,120,567, Cl. 350-350.000.
Krishnamurthy, Varahur Ramaswamy, 4,121,257, Cl. 358-246.000.
Ream, Thomas A.: *See—*
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Recovery Systems, Inc.: *See—*
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Rector, Carl M.: *See—*
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Redman, Michael James: *See—*
Dye, Malcolm Stuart; Redman, Michael James; and Satchell, David W., 4,121,260, Cl. 358-295.000.
Reed, Robert D., to John Zink Company. Hot water spray injection for smoke suppression in flares. 4,120,637, Cl. 431-5.000.
Rees, Gordon H. Corner bracket. 4,120,600, Cl. 403-231.000.
Reeve, Richard James; and Shirley, Dennis Raymond. Self-steering tandem axle bogie. 4,120,509, Cl. 280-81.00A.
Reid, Neil M.: *See—*
French, John Barry; Reid, Neil M.; and Buckley, Janette A., 4,121,099, Cl. 250-296.000.
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Silbernagel, John P., 4,121,070, Cl. 20-67.0DB.
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McRoskey, John W.; McRoskey, Leonard H.; and Swartz, Delbert D., 4,120,427, Cl. 222-193.000.
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Reum, Donald J. Method for producing a spirally wound plastic article. 4,120,929, Cl. 264-210.00R.
Rexroad, James O.; and Majcher, John P., to Westinghouse Electric Corp. Contact structure for drawout switchgear. 4,121,067, Cl. 200-50.0AA.
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Rialan, Joseph: *See—*
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Neumann, Arthur E., 4,120,397, Cl. 206-370.000.
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Hafele, Joseph C.; Richards, Thomas J.; and Wright, Paul L., 4,120,261, Cl. 118-630.000.
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Clauder, Otto; Kokosi, Jozsef; Szporny, Laszlo; and Karpati, Egon, 4,120,858, Cl. 260-293.550.
Ridgway, John E., to Hooker Chemicals & Plastics Corp. Compressible self guiding electrode assembly. 4,120,773, Cl. 204-252.000.
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Parmann, Gunnar, 4,120,521, Cl. 285-113.000.
Rieger, Michael Lawrence, to Tektronix, Inc. Constant velocity vector generator employing absolute value amplifier circuits. 4,121,299, Cl. 364-807.000.
Riew, Changkiu Keith, to B. F. Goodrich Company, The. Hydroxyl-containing liquid polymers and process for preparation thereof. 4,120,766, Cl. 204-158.00R.
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Cox, Allen Ronald; Hatchett, Michael Robert; and Rigbey, Leonard John, 4,120,505, Cl. 274-39.00R.
Rinehart, Jay Kent, to PPG Industries, Inc. S-aryl N-cycloalkylthiolcarbamates. 4,120,886, Cl. 260-455.00A.
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Rios, Roberto. Reading stand with magnifier. 4,120,564, Cl. 350-241.000.
Ripley, Richard Edward, to Textron, Inc. Electronic watch. 4,120,149, Cl. 58-88.00R.
Rippere, Ralph E. Production of powder metallurgy alloys. 4,120,758, Cl. 204-10.000.
Ripphahn, Johannes; and Kriegbaum, Ernst, to Merck Patent Gesellschaft mit beschrankter Haftung. Device for the repeated reproducible delivery of definite variable amounts by volume. 4,120,205, Cl. 73-425.600.
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Roano, Domenico, to Ing. C. Olivetti & C., S.p.A. Line-spacing system for printing office machines. 4,120,593, Cl. 400-549.000.
Robert Bosch GmbH: *See—*
Beck, Otto; and Hamm, Klaus, 4,120,235, Cl. 93-33.00H.
Fleischer, Helmut, 4,120,373, Cl. 180-105.00E.
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Roberts, Charles William, to Minnesota Mining and Manufacturing Company. Conformable foam. 4,121,005, Cl. 428-131.000.
Roberts, Thomas G., to United States of America, Army. Collective ion accelerator with foil-less beam extraction window. 4,121,128, Cl. 313-7.000.
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Hunt, Raymond L.; Lin, Ben H.; Ream, Thomas A.; Robertson, Gene D.; and Young, John H., 4,121,135, Cl. 315-169.00R.
Robin, Jacques Andre. Strings formed at least partially of synthetic material. 4,120,146, Cl. 57-162.000.
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Rockwell International Corporation: *See—*
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Jackson, Eugene D., III, 4,120,152, Cl. 60-221.000.
Kunkle, Timothy Edward, 4,120,596, Cl. 403-14.000.
Malmuth, Norman D.; Birnbaum, George; and Iceland, William F., 4,121,087, Cl. 219-121.00L.
Rodd, Charles R.; and Scheuerman, Richard L., to Magnetic Peripherals Inc. Ribbon cable slitter and method of stripping cable. 4,120,217, Cl. 81-9.510.
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Rodgers, Franklin Bartlett; and Grassl, Herbert, to Credelca A.G. Method of constructing a transportable prefabricated room element. 4,120,133, Cl. 52-745.000.
Rodnunsky, Patricia A. Macrame-forming device. 4,120,522, Cl. 289-18.000.
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Roeber, Frederick W., to Raytheon Company. Position and force measuring system. 4,121,049, Cl. 178-18.000.
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Rohm and Haas Company: *See—*
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Purvis, Marshall T.; and Grant, R. Peter, 4,120,833, Cl. 921-81.000.
Seidel, Michael C.; von Meyer, William C.; and Greenfield, Stanley A., 4,120,864, Cl. 260-308.00R.
Weiler, Ernest D.; Weir, W. David; and Wolfersberger, Martha, 4,120,957, Cl. 424-204.000.
Rohner, Joachim, to W. Schlafhorst & Co. Apparatus for transporting coil cores. 4,120,526, Cl. 294-87.00R.
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Roley, Robert D.; Haslett, Glenn M.; and Blunier, Dennis L., to Cater-

pillar Tractor Co. Track link assembly having roller bushings. 4,120,537, Cl. 305-14.000.

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Rolls-Royce Limited: *See—*
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Rose, Jack Howard, to Massey-Ferguson Inc. Implement supporting and lifting linkage. 4,120,136, Cl. 56-17.100.

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Rosemount Inc.: *See—*
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Rud, Stanley E., Jr., 4,120,206, Cl. 73-718.000.

Rosenast, Louis, to Ruti Machinery Works Ltd. Shuttle construction. 4,120,328, Cl. 139-196.100.

Rosey, Richard: *See—*
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Ross, Sidney D.; and Linzey, Raynor, to Sprague Electric Company. Ester dielectric fluid containing tert-butyl anthraquinone. 4,121,275, Cl. 361-319.000.

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Rotenberg, Don H.: *See—*
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Roth, Donald J., to Continental Group, Inc., The. Method of fabricating plastic containers having reduced gas permeability from a composite billet. 4,120,932, Cl. 264-292.000.

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Royer, Dennis J.: *See—*
Starks, Charles M.; Jackson, Robert G.; Porchey, David V.; and Royer, Dennis J., 4,120,881, Cl. 260-449.60R.

Rozhetskaya, Karina Moiseevna: *See—*
Kuznetsova, Nadezhda Nikolaevna; Samsonov, Georgy Vasilievich; Papukova, Klavdia Pavlovna; Bilibina, Galina Vladimirovna; Shataeva, Larisa Konstantinovna; Selezneva, Aida Alexandrovna; Kuznetsova, Nina Petrovna; Vitols, Oyar Ansovich; Shtrausa, Anite Ansovna; Gudkin, Lev Romanovich; Mishaeva, Rimma Nikodimovna; and Rozhetskaya, Karina Moiseevna, 4,120,831, Cl. 521-38.000.

Rud, Stanley E., Jr., to Rosemount Inc. Differential pressure sensor capsule with low acceleration sensitivity. 4,120,206, Cl. 73-718.000.

Ruggles, Richard L., to Clemar Manufacturing Corporation. Station timing selection circuit for irrigation controller. 4,121,114, Cl. 307-141.000.

Ruskin, Bernard J.: *See—*
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Russell, David B.: *See—*
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Russo, Joseph J. Snore-prevention article and process for manufacturing the same. 4,120,299, Cl. 128-140.00N.

Russo, Robert V.: *See—*
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Schafer, Werner; Scholz, Hans-Albrecht; and Wilhelm, Siegfried, 4,120,837, Cl. 260-22.00S.

Ruther, Manfred: *See—*
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Rutner, Herman: *See—*
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Rypstat, William B. Humane sacrificer. 4,120,075, Cl. 17-1.00R.

S.E.R.A. Husson Societe d'Etudes et Realisations Aerodynamiques: *See—*
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Saari, Walfred S.; and Huff, Joel R., to Merck & Co., Inc. Novel N-carboxy-alpha-amino acid anhydrides. 4,120,971, Cl. 424-272.000.

Sabranski, Udo; and Schmitt, Jochen, to Rheinmetall GmbH. Submarine explosive cable cutting device towed by a towing cable. 4,120,246, Cl. 102-24.0HC.

Sack, Berthold: *See—*
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Saggers, David Thomas: *See—*
Gates, Peter Stuart; Gillon, John; and Saggers, David Thomas, 4,120,871, Cl. 260-343.30R.

Saida, Takashi: *See—*
Yamashita, Hiroshi; Osawa, Sadao; Saida, Takashi; and Sakasai, Yutaka, 4,120,805, Cl. 252-62.10L.

Saiki, Yukimi; Oguino, Masanori; and Watanabe, Shutoku, to Hitachi, Ltd. Automatic brightness limiter circuit. 4,121,252, Cl. 358-169.000.

Saint-Gobain Industries: *See—*
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Philibert, Daniel, 4,120,679, Cl. 65-60.00B.

Sakaguchi, Keiichi; Komine, Yoshio; Ichiyanagi, Toshikazu; Shimazaki, Mamoru; and Hosoe, Kazuya, to Canon Kabushiki Kaisha. Motion picture camera for use with a cartridge for film having a sound track. 4,120,571, Cl. 352-27.000.

Sakaguchi, Shinji: *See—*
Nakazyo, Kiyoshi; Sakaguchi, Shinji; and Tsuji, Nobuo, 4,120,725, Cl. 96-97.000.

Sakai, Yoshihisa: *See—*
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Sakasai, Yutaka: *See—*
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Sakurai, Hisaya; Morita, Hideo; Ikegami, Tadashi; Maeda, Katsuaki; and Furusato, Masayasu, to Asahi Kasei Kogyo Kabushiki Kaisha. Method for producing an organomagnesium complex. 4,120,883, Cl. 260-448.00A.

Sakurai, Nobuo: *See—*
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Sakuranaka, Toru: *See—*
Isobe, Hiroshi; Koyanagi, Toru; and Sakuranaka, Toru, 4,120,275, Cl. 123-140.0MC.

Salomon, Georges Pierre Joseph, to Etabliessements Francois Salomon et Fils. Method for adjusting a ski-boot to a skier's foot. 4,120,064, Cl. 12-142.00R.

Salve, Roger M. Electronic device for automatically controlling the level of a liquid in a vat. 4,120,611, Cl. 417-36.000.

Salyers, John C.: *See—*
Hopkins, Donald J.; Salyers, John C.; and Goranson, Paul L., 4,120,415, Cl. 220-1.00T.

Samide, Frank R., to Towmotor Corporation. Latch for overhead guards on industrial vehicles. 4,120,528, Cl. 296-107.000.

Samsonov, Georgy Vasilievich: *See—*
Kuznetsova, Nadezhda Nikolaevna; Samsonov, Georgy Vasilievich; Papukova, Klavdia Pavlovna; Bilibina, Galina Vladimirovna; Shataeva, Larisa Konstantinovna; Selezneva, Aida Alexandrovna; Kuznetsova, Nina Petrovna; Vitols, Oyar Ansovich; Shtrausa, Anite Ansovna; Gudkin, Lev Romanovich; Mishaeva, Rimma Nikodimovna; and Rozhetskaya, Karina Moiseevna, 4,120,831, Cl. 521-38.000.

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Samuelson, Svante Ragnar: *See—*
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Sanci, Salvatore; and Di Mauro, Innocenzio. Rearview apparatus for vehicles. 4,120,566, Cl. 350-302.000.

Sanders, James Milton: *See—*
Light, Kenneth K.; Sanders, James Milton; Vock, Manfred Hugo; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja Dulal; Tseng, Ching Y.; and Sprecker, Mark A., 4,120,308, Cl. 131-17.00R.

Sanders, O'Neal. Safety device for tractor-trailers to prevent jackknifing. 4,120,514, Cl. 280-432.000.

Sandox, Inc.: *See—*
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Sandoz Ltd.: *See—*
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Bormann, Gerhard; and Berthold, Richard, 4,120,965, Cl. 424-258.000.
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Sangamo Electric Company: *See—*
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Sanker, Philip E.: *See—*
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Santilli, James N., to Westinghouse Electric Corp. Indicating sectional composite fuse construction using standard-type fuse link. 4,121,186, Cl. 337-161.000.

Sarge, Henry David, III; and Kleinschmidt, David Charles, to Procter & Gamble Company, The. Use of ozone treated chemithermomechanical pulp in a high bulk tissue papermaking process. 4,120,747, Cl. 162-117.000.

Satchell, David W.: *See—*
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Sato, Yasuyuki: *See—*
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Satzinger, Gerhard: *See—*
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Saul, Franz J. Polygonally wrapped sleeve, and methods and devices for making same. 4,120,323, Cl. 138-129.000.

Saunders, Robert L.: *See—*
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Saunders, William T., to National Steel Corporation. High strength seamless chime can body, sheet metal container for vacuum packs, and manufacture. 4,120,419, Cl. 220-66.000.

Saunier, Marc: *See—*
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Schafer, Anton; Probst, Karl; and Hufken, Kurt, to Lindemann Maschinenfabrik GmbH. Bale binding apparatus with resiliently mounting filament twisting mechanism. 4,120,238, Cl. 100-11.000.

Schafer, Werner; Scholz, Hans-Albrecht; and Wilhelm, Siegfried, to Rutgerswerke Aktiengesellschaft. Organosiloxanes useful in molding compositions based on unsaturated polyesters and unsaturated monomers. 4,120,837, Cl. 260-22.00S.

Schaffling, Otto G., to Olin Corporation. Solid propellant gas generating device. 4,120,153, Cl. 60-255.000.

Schampers, Paulus Philippus Maria; Carasso, Marino Giuseppe; and Klostermann, Frits Theodoor, to U.S. Philips Corporation. Television camera apparatus. 4,121,255, Cl. 358-223.000.

Schechter, Israel. Transplants. 4,120,649, Cl. 8-94.110.

Schempp, Roland: *See—*
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Schenone, Pietro: *See—*
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Scheuerman, Richard L.: *See—*
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Schick, Hans: *See—*
Mueller-Tamm, Heinz; Schick, Hans; Jaggard, James F. R.; and Nickl, Johann, 4,120,823, Cl. 252-442.000.

Schiemann, Siegfried, to SKF Kugellagerfabriken GmbH. Lubricating device. 4,120,541, Cl. 308-187.000.

Schier, Ernst-Juergen: *See—*
Gettert, Hans; Fromm, Hermann Dieter; Molzahn, Martin; Schier, Ernst-Juergen; and Schneehage, Hans Henning, 4,120,667, Cl. 55-48.000.

Schimmel, Joannes: *See—*
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Schindhelm, Karl-Heinz: *See—*
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Schittenhelm, Rudolf: *See—*
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Schlau, Floyd E.; and Morrison, Howard J., to Marvin Glass & Associates. Craft device for decoratively deforming metal cans and the like. 4,120,190, Cl. 72-458.000.

Schlossberg, Howard R., to United States of America, Air Force. Laser capable of producing a frequency standard. 4,121,178, Cl. 331-94.50G.

Schlumberger Technology Corporation: *See—*
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Schmidt, Paul Herman: *See—*
Bachmann, Klaus Jurgen; Schmidt, Paul Herman; Spencer, Edward Guerrant; and Harsha, Karnamadakala Sreenivasaacharlu Sree, 4,121,238, Cl. 357-16.000.

Schmitt, Jochen: *See—*
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Schmitt, Kirk D., to Mobil Oil Corporation. Process for preparing tertiary alkylphosphorodichloridites. 4,120,917, Cl. 260-976.000.

Schneehage, Hans Henning: *See—*
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Schneider, Franz; Braitinger, Helmut; and Schumann, Burkhard, to L. Schuler GmbH. Control system for operating steps of a press and/or transfer mechanism. 4,120,185, Cl. 72-24.000.

Schneider, Marvin J.: *See—*
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Schoeneberger, Ernest A.; and Blakeslee, Edward A., to Sperry Rand Corporation. Tine bar retaining device. 4,120,137, Cl. 56-226.000.

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Scholer, Fred R.; and Blumbergs, John H., to FMC Corporation. Aromatic sulfonyl azides as peroxygen activators. 4,120,652, Cl. 8-111.000.

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Schollmeier, Gero, to Siemens Aktiengesellschaft. Filtering circuit for a phase-locked loop. 4,121,171, Cl. 331-1.00A.

Scholz, Hans-Albrecht: *See—*
Schafer, Werner; Scholz, Hans-Albrecht; and Wilhelm, Siegfried, 4,120,837, Cl. 260-22.00S.

Schreiber, William L.: *See—*
Light, Kenneth K.; Sanders, James Milton; Vock, Manfred Hugo; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja Dulal; Tseng, Ching Y.; and Sprecker, Mark A., 4,120,308, Cl. 131-17.00R.

Schroder, Rolf: *See—*
Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Hammann, Ingeborg; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,120,956, Cl. 424-200.000.

Schulte-Elte, Karl-Heinrich: *See—*
Renold, Walter; Skorianetz, Werner; Schulte-Elte, Karl-Heinrich; and Ohloff, Gunther, 4,120,830, Cl. 252-522.000.

Schultz, Robert S., to Risdon Manufacturing Company, The. Tip seal dispenser valve for a pressurized container. 4,120,431, Cl. 222-518.000.

Schulz, Bernhard: *See—*
Kuhl, Karl-Heinz; Muranka, Eberhard; Schulz, Bernhard; and Tielens, Asmund, 4,121,189, Cl. 338-226.000.

Schumacher, Gunter: *See—*
Schumacher, Gustav, II; and Schumacher, Gunter, 4,120,138, Cl. 56-313.000.

Schumacher, Gustav, II; and Schumacher, Gunter. Grain lifter for the cutter mechanisms of harvesters. 4,120,138, Cl. 56-313.000.

Schumann, Burkhard: *See—*
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Schwab, Frederick C.: *See—*
Chen, Catherine S. H.; Schwab, Frederick C.; and Sheppard, Edward W., 4,120,801, Cl. 252-8.55D.

Schwab, Manfred, to Fa Alfred Hansel, Nieten-Und Metallwarenfabrik. Blind riveter. 4,120,188, Cl. 72-391.000.

Schwartz, Theodore F., to Scott & Fetzer Company, The. Method and apparatus for processing photographic film. 4,121,237, Cl. 354-323.000.

Schwarz, Rudolf, to Staeubli Ltd. Double-lift dobby. 4,120,327, Cl. 139-71.000.

Schwarzmann, Gunter; Holtschmidt, Ulrich; and Bertelmann, Gunter, to Th. Goldschmidt AG. Alkylated polyamines, their preparation and use as microbiocides. 4,120,979, Cl. 424-325.000.

Schwing, Gregory Wayne, to Du Pont de Nemours, E. I., and Company. 2-Alkyl-1-naphthol-4-sulfonic acids. 4,120,897, Cl. 260-543.00R.

Scientific-Atlanta, Inc.: *See—*
Robinson, Glen P., Jr.; and Shelton, Samuel V., 4,120,316, Cl. 137-498.000.

Scillieri, Antoine; and Caillaud, Alain, to Electronique Marcel Dassault. Flat radar antenna employing circular array of slotted waveguides. 4,121,220, Cl. 343-768.000.

Scott & Fetzer Company, The: *See—*
Horrocks, Raymond G., 4,120,557, Cl. 339-252.00R.
Schwartz, Theodore F., 4,121,237, Cl. 354-323.000.

Scott, Gerald. Polymer compositions. 4,121,025, Cl. 526-4.000.

Scott Paper Company: *See—*
Gross, Frank C., 4,120,720, Cl. 96-1.50N.

Screg Routes et Travaux Publics: *See—*
Ceintrey, Marcel, 4,120,832, Cl. 260-2.300.

Seddon, Robert Maxwell, to Unitex Limited. Foam sandwich constructions. 4,121,008, Cl. 428-251.000.

Seebach, Dieter: *See—*
Pohlemann, Heinz; Naarmann, Herbert; and Seebach, Dieter, 4,121,027, Cl. 526-29.000.

Seeger, Wolfgang: *See—*
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Segawa, Keiji: *See—*
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Segin, Peter: *See—*
Preuss, Dieter; and Segin, Peter, 4,121,259, Cl. 358-261.000.

Seidel, Michael C.; von Meyer, William C.; and Greenfield, Stanley A., to Rohm and Haas Company. 1,2,4-4H-triazole derivatives. 4,120,864, Cl. 260-308.00R.

Seiden, Paul, to Procter & Gamble Company, The. Polyoxyalkylene propylene glycol esters for improved cooking and salad oil. 4,120,990, Cl. 426-601.000.

Seidler, Jack, to North American Specialties Corporation. Solder bearing terminal. 4,120,558, Cl. 339-275.00T.

Seifert, Horst: *See—*
Krol, Johannes Wilhelmus Antonius; Lersmacher, Bernhard; and Seifert, Horst, 4,120,080, Cl. 29-25.180.

Seiger, Harvey N.; and Puglisi, Vincent J., to Yardney Electric Corporation. Method of making sintered plaque cadmium electrodes. 4,120,757, Cl. 204-2.100.

Selezneva, Aida Alexandrovna: *See—*
Kuznetsova, Nadezhda Nikolaevna; Samsonov, Georgy Vasilievich; Papukova, Klavdia Pavlovna; Bilibina, Galina Vladimirovna; Shataeva, Larisa Konstantinovna; Selezneva, Aida Alexandrovna; Kuznetsova, Nina Petrovna; Vitols, Oyar Ansovich; Shtrausa, Anite Ansovna; Gudkin, Lev Romanovich; Mishaeva, Rimma Nikodimovna; and Rozhetskaya, Karina Moiseevna, 4,120,831, Cl. 521-38.000.

Sellien, Gero: *See—*
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Seltzer, Daniel A., to DAS Design Corporation. Timing control for AC power circuit. 4,121,149, Cl. 323-19.000.

Semler, Joel H. Apparatus for sealing flange joints. 4,120,256, Cl. 113-57.000.

Senn, Martin: *See—*
Kampe, Wolfgang; Senn, Martin; Thiel, Max; Bartsch, Wolfgang; and Dietmann, Karl, 4,120,963, Cl. 424-256.000.

Sepulveda, Jaime E.: *See—*
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Serrano, Juan de J.: *See—*
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Seubert, Jurgen; Pohlke, Rolf; Thomas, Herbert; and Andrews, Peter, to E. Merck. Ring substituted pyrazino-isoquinoline derivatives and their preparation. 4,120,961, Cl. 424-250.000.

Severin, Hubert J. Cleaning system. 4,120,070, Cl. 15-306.00B.

Seybert, William J.: *See—*
Shiflett, Ned H.; and Seybert, William J., 4,120,555, Cl. 339-126.00R.

Shaffer, Paul E., to PPG Industries, Inc. Haze-free transparent laminate having a plasticized polyvinyl acetal sheet. 4,121,014, Cl. 428-412.000.

Shakespeare Company: *See—*
McLain, Philippe Hardy-The, 4,120,255, Cl. 112-222.000.

Sharma, Bhim Sain: *See—*
Phipps, Peter Beverley; Sharma, Bhim Sain; and Wu, Anthony Wai, 4,120,995, Cl. 427-248.00A.

Sharp, Bernard C.; and Petrik, John T., to Parker-Hannifin Corporation. Adapter for coupling windshield wiper blade holder with hooked wiper arm. 4,120,069, Cl. 15-250.320.

Sharp, Harper Eugene: *See—*
Kennedy, Alvin B., Jr.; Shirey, Lawrence E.; Sharp, Harper Eugene; Trowbridge, Lawrence E.; and Magee, Robert L., 4,120,699, Cl. 134-1.000.

Sharps Associates: *See—*
Lee, Cheuk Man; and Michaels, Raymond John, 4,120,873, Cl. 260-343.210.

Shataeva, Larisa Konstantinovna: *See—*
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Shaw, Alexander: *See—*
Paton, John Stewart; and Shaw, Alexander, 4,120,291, Cl. 128-2.00V.

Sheinbaum, Itzhak. Power conversion and systems for recovering geothermal heat. 4,120,158, Cl. 60-641.000.

Shell Internationale Research Maatschappij B.V.: *See—*
Collins, Michael H.; and Le Hardy Guiton, Jeremy D., 4,120,418, Cl. 220-444.000.
van der Burgt, Maarten J., 4,120,410, Cl. 214-17.00B.

Shell Oil Company: *See—*
Denison, Early B., 4,121,193, Cl. 340-18.0CM.
Goudriaan, Frans; and Van Klinken, Jakob, 4,120,778, Cl. 208-80.000.
Sie, Swan T.; and Bukkems, Franciscus H. J., 4,120,781, Cl. 28-251.00R.

Shelton, David Lee, to Procter & Gamble Company, The. Two phase antiperspirant compositions. 4,120,948, Cl. 424-66.000.

Shelton, Samuel V.: *See—*
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Shepherd, Glen C.: *See—*
Bileski, Thomas; Crawford, Joe W.; Blanton, Bobby D.; Johnson, Carl N.; Garcia, Felix; Orcutt, John W.; Shepherd, Glen C.; and Oursler, James A., 4,121,073, Cl. 200-83.00P.

Sheppard, Edward W.: *See—*
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Sherburn, Raymond Robert, to Canadian General Electric Company, Limited. Mullion adjusting device. 4,120,550, Cl. 312-296.000.

Sherk, Fred T.: *See—*
Irvin, Howard B.; and Sherk, Fred T., 4,121,029, Cl. 526-64.000.

Shichman, Daniel, to Uniroyal, Inc. Pneumatic tire having carcass cords which depart from the radial plane in the tread region. 4,120,339, Cl. 152-354.0RB.

Shiflett, Ned H.; and Seybert, William J., to Eltra Corporation. Connector-terminal assembly for electrical conductors. 4,120,555, Cl. 339-126.00R.

Shiga, Tetsuo: *See—*
Kobayashi, Hidehiko; Arakawa, Tatsumi; Shiga, Tetsuo; Ohmura, Kaoru; and Ito, Sakae, 4,121,007, Cl. 428-201.000.

Shimano Industrial Company Limited: *See—*
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Shimanuki, Kozi: *See—*
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Shimazaki, Mamoru: *See—*
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Shimizu, Hiroshi: *See—*
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Shinagawa Roko Kabushiki Kaisha: *See—*
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Shinagawa Shirorenga Kabushiki Kaisha: *See—*
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Shinoda, Akibumi; and Kido, Noriyoshi, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Tiltable cab construction for an industrial vehicle. 4,120,375, Cl. 180-89.140.

Shiraki, Hisashi, to Kitagawa Iron Works Co., Ltd. Soil treatment. 4,120,163, Cl. 405-264.000.

Shirey, Lawrence E.: *See—*
Kennedy, Alvin B., Jr.; Shirey, Lawrence E.; Sharp, Harper Eugene; Trowbridge, Lawrence E.; and Magee, Robert L., 4,120,699, Cl. 134-1.000.

Shirland, Fred A., to Westinghouse Electric Corp. Vacuum deposition process for fabricating a CdS—Cu_2S heterojunction solar cell device. 4,120,705, Cl. 148-174.000.

Shirley, Dennis Raymond: *See—*
Reeve, Richard James; and Shirley, Dennis Raymond, 4,120,509, Cl. 280-81.00A.

Shisler, Donald Eugene: *See—*
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Shorthill, Richard W.: *See—*
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Showalter, Dan Joseph, to Borg-Warner Corporation. Transmission shift control mechanism. 4,120,211, Cl. 74-473.00R.

Shtrausa, Anite Ansovna: *See—*
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Shuster, Edward J.: *See—*
Light, Kenneth K.; Sanders, James Milton; Vock, Manfred Hugo; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja Dulal; Tseng, Ching Y.; and Sprecker, Mark A., 4,120,308, Cl. 131-17.00R.

Sie, Swan T.; and Bukkems, Franciscus H. J., to Shell Oil Company. Process for reducing the level of radioactivity of a stream of light hydrocarbons. 4,120,781, Cl. 28-251.00R.

Siemens Aktiengesellschaft: *See—*
Adelski, Hans-Joachim; and Gertz, Wilhelm, 4,121,127, Cl. 310-67.00R.
Baues, Peter; and Winzer, Gerhard, 4,120,560, Cl. 350-96.140.
Becker, Friedbert; Grafinger, Wilhelm; and Hildebrandt, Bernhard, 4,121,208, Cl. 343-6.50R.
Hadersbeck, Hans; Andrascek, Ernst; and Groeber, Alfred, 4,121,044, Cl. 174-68.500.
Hanni, Manfred, 4,121,158, Cl. 325-55.000.
Happak, Heinz; and Wittmann, Alfred, 4,120,545, Cl. 312-7.00R.
Hartmann, Heribert; and Wess, Guenter, 4,121,170, Cl. 331-1.00A.
Hilbert, Ferdinand, 4,121,277, Cl. 361-433.000.
Hoffmann, Kurt; and Wotruba, Gottfried, 4,121,117, Cl. 307-221.00D.
Jejina, Filip, 4,121,047, Cl. 178-3.000.
Lampert, Ernst, 4,121,159, Cl. 325-65.000.
Muz, Edwin, 4,120,553, Cl. 339-91.00R.
Schollmeier, Gero, 4,121,171, Cl. 331-1.00A.
Simson, Reiner; Schindhelm, Karl-Heinz; and Vogel, Werner, 4,121,274, Cl. 361-273.000.

Silbernagel, John P., to Renal Systems, Inc. Enclosed push button type switch. 4,121,070, Cl. 20-67.0DB.

Silver, Gary L., to United States of America, Energy. Decontamination of plutonium from water with chitin. 4,120,933, Cl. 423-6.000.

Sim, Malcolm F.: *See—*
Bristow, Norman W.; Macey, Peter E.; Nichol, Kenneth J.; and Sim, Malcolm F., 4,120,960, Cl. 424-250.000.

Simmers, Charles Donald: *See—*
Hahn, William Peter; Hite, Edward Lee; Shisler, Donald Eugene; and Simmers, Charles Donald, 4,120,676, Cl. 65-4.00R.

Simmons, Gerald P.: *See—*
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Simon, Robert L., Jr.: *See—*
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Simos, Rigas Christos, to General Enterprises Corp., Ltd. Apparatus for manufacturing plastic tubes from plastics of dissimilar properties. 4,120,628, Cl. 425-131.100.

Simson, Reiner; Schindhelm, Karl-Heinz; and Vogel, Werner, to Siemens Aktiengesellschaft. Self-healing electrical capacitor and method for its production. 4,121,274, Cl. 361-273.000.

Sindt, Melvin R., to Boeing Company, The. Method of securing two non-metal surfaces together using a hot melt type fastener heatable by induction heating. 4,120,712, Cl. 156-71.000.

Singer Company, The: *See—*
Goldfischer, Lester Irving, 4,121,210, Cl. 343-8.000.

Herr, John A.; and Transue, James A., 4,120,254, Cl. 112-158.00E.
Price, Arthur B., 4,121,263, Cl. 360-27.000.
Sivachenko, Eugene W.; Broacha, Firoze H.; and Larkin, Artemas M., to Sivachenko, Eugene W. Lightweight modular, truss-deck bridge system. 4,120,065, Cl. 14-6.000.
Sjogren, Karl-Erik, to American Air Filter Company, Inc. Fume hood for a melt pot. 4,120,487, Cl. 266-158.000.
Skaggs, Boyd T., to Container Corporation of America. Partition arrangement. 4,120,442, Cl. 229-15.000.
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SKF Kugellagerfabriken GmbH: *See—*
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Schiemann, Siegfried, 4,120,541, Cl. 308-187.000.
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Skoyles, Derek Robert, to U.S. Philips Corporation. Anti-lock vehicle brake systems. 4,120,317, Cl. 137-509.000.
Sloan-Kettering Institute for Cancer Research: *See—*
Goldstein, Gideon, 4,120,951, Cl. 424-177.000.
Sloan Valve Company: *See—*
Horowitz, Charles, 4,121,066, Cl. 200-51.00R.
Lissau, Frederic, 4,120,314, Cl. 137-329.400.
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Fly, James Alan; and Slonaker, Robert O., 4,120,191, Cl. 73-9.000.
Sloyan, Jerome J., to Automatic Motor Base Co. Mount for motor having variable pitch pulley. 4,120,210, Cl. 74-242.13R.
Small, Robert James, to Ashland Oil, Inc. Method for platinum or palladium catalyst reactivation. 4,120,819, Cl. 252-413.000.
Smith, Charles A.; and Merritt, John H., to Sperry Rand Corporation. Feeder penetration adjustment mechanism. 4,120,241, Cl. 100-142.000.
Smith, Donald Wayne; Swisher, George W., Jr.; and Teel, Larry W., to CMI Corporation. Sidebank excavator with rotating vertical cutter assembly. 4,120,106, Cl. 37-190 000.
Smith, Elmer Gene: *See—*
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Smith, George L. Container compactor. 4,120,240, Cl. 100-45.000.
Smith, Herman W., to Upjohn Company, The. 3,7-Inter-m-phenylene-3-oxa-13,14-didehydro-11-deoxy-17-phenyl-4,5,6,18,19,20-hexanor-PGE_1 compounds. 4,121,038, Cl. 560-53.000.
Smith, James W., to Standard Oil Company (Indiana). Apparatus for correlating two time series. 4,121,297, Cl. 364-728.000.
Smith Kline & French Laboratories Limited: *See—*
Brown, Thomas Henry; Durant, Graham John; Ganellin, Charon Robin; and Ife, Robert John, 4,120,966, Cl. 424-263.000.
Brown, Thomas Henry; Durant, Graham John; Ganellin, Charon Robin; and Ife, Robert John, 4,120,972, Cl. 424-273.00R.
Ganellin, Charon Robin; and Young, Rodney Christopher, 4,120,968, Cl. 424-263.000.
Ganellin, Charon Robin; and Young, Rodney Christopher, 4,120,973, Cl. 424-273.00R.
Smith, Norman Alfred; and Kitzing, Rainer, to Ciba-Geigy AG. Sulfur containing vinyl amide cross-linking agents. 4,120,898, Cl. 260-561.00S.
Smith, Robert H., to Gilbert Associates, Inc. Brick and method of making same. 4,120,735, Cl. 106-84.000.
Smith, William L.; Kelyman, Jacqueline S.; and Jones, Ladell, to Dow Chemical Company, The. Ashless oil dispersants. 4,120,804, Cl. 252-47.500.
Smolka, Heinz, to Henkel Kommanditgesellschaft auf Aktien. Method of machine washing of solid soiled materials by contacting the circulating wash liquid with organic cationic exchange resins. 4,120,653, Cl. 8-137.000.
Smyth, Milagros B.; and Lee-You, James, to Johnson & Johnson. Novel low temperature maturing dental glaze. 4,120,729, Cl. 106-35.000.
Smyth, Richard T., to Metco, Inc. Method and apparatus for plasma flame-spraying coating material onto a substrate. 4,121,083, Cl. 219-76.160.
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Snijders, Wilfred Andre Maria; Verhoeckx, Nicolaas Alphonsus Maria; Van Gerwen, Petrus Josephus; and Van Essen, Hendrik Arie, to U.S. Philips Corporation. Digital signal processing arrangement. 4,121,296, Cl. 364-724.000.
Snyder, David E., to U.S. Industries, Inc. Velocity check valve. 4,120,315, Cl. 137-454.600.
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Societa' Italiana Resine S.I.R. S.p.A.: *See—*
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Societe Anonyme dite Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
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Societe Anonyme dite: Societe Europeene de Propulsion: *See—*
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Societe d'Etudes de Machines Thermiques-S.E.M.T.: *See—*
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Societe Nationale des Poudres et Explosifs: *See—*
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Societe Nationale Elf Aquitaine: *See—*
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Chateau, Georges M.; and Falkner, Chester B., Jr., 4,120,171, Cl. 405-169.000.
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de Lautrec, Jacques; and Coste, Jean-Francois, 4,120,816, Cl. 252-361.000.
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Solar Apparatus & Equipment Limited: *See—*
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Solomon, Elias E., to Gamewell Corporation, The. Ionization detector. 4,121,105, Cl. 250-381.000.
Solomon, Elias E. Optically biased smoke detector. 4,121,110, Cl. 340-630.000.
Soltes, Isaac B. Case for carrying pendant and chain. 4,120,394, Cl. 206-45.340.
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Soma, Akiro; Kawashima, Haruro; Yamauchi, Makoto; and Tanaka, Shoji, to Bridgestone Tire Company Limited. Safety pneumatic tire for passenger cars. 4,120,337, Cl. 152-353.00R.
Sommer, Irving, to Toy Professionals Unlimited, Inc. Collapsible rocking toy. 4,120,493, Cl. 272-52.000.
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Kishi, Yoshio; and Nagami, Masaru, 4,121,264, Cl. 360-55.000.
Morita, Kouji; and Isono, Katsuo, 4,121,254, Cl. 358-195.000.
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Sorensen, Heine Ahlgreen. Lump breaking device. 4,120,461, Cl. 241-283.000.
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Spector, George: *See—*
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Speich, Francisco, to Jakob Muller, Forschungs-und Finanz AG. Arrangement for severing webs. 4,120,221, Cl. 83-62.100.
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Marles, Kevin C.; Spencer, Brian W.; and Spencer, Raymond, 4,120,287, Cl. 126-271.000.
Spencer, Edward Guerrant: *See—*
Bachmann, Klaus Jurgen; Schmidt, Paul Herman; Spencer, Edward Guerrant; and Harsha, Karnamadakala Sreenivasaacharlu Sree, 4,121,238, Cl. 357-16.000.
Spencer, Raymond: *See—*
Marles, Kevin C.; Spencer, Brian W.; and Spencer, Raymond, 4,120,287, Cl. 126-271.000.
Sperry Rand Corporation: *See—*
Schoeneberger, Ernest A.; and Blakeslee, Edward A., 4,120,137, Cl. 56-226.000.
Smith, Charles A.; and Merritt, John H., 4,120,241, Cl. 100-142.000.
Spurgin, William T., 4,120,258, Cl. 114-144.00E.
Spies, Alfons, to Dr. Johannes Heidenhain GmbH. Planar measuring instrument. 4,120,093, Cl. 33-174.00P.
Spirit of America, Inc.: *See—*
Doll, Ronald L., 4,121,278, Cl. 362-72.000.
Spitzer, Donald P.; and Bambrick, William Edward, to American Cyanamid Company. Staged rehydration of alumina. 4,120,942, Cl. 423-626.000.
Spitzer, Donald P.: *See—*
Ebel, Robert H.; Spitzer, Donald P.; and Bambrick, William Edward, 4,120,826, Cl. 252-465.000.
Spivack, John D.; and Luzzi, John J., to Ciba-Geigy Corporation. Benzoyloxybenzoates and compositions stabilized therewith. 4,120,846, Cl. 260-45.85B.
Spoor, Herbert: *See—*
Kovacs, Jenoe; Jung, Hans; Marx, Matthias; and Spoor, Herbert, 4,121,266, Cl. 528-288.000.
Sprague Electric Company: *See—*
Burn, Ian, 4,120,677, Cl. 65-18.000.
Ross, Sidney D.; and Linzey, Raynor, 4,121,275, Cl. 361-319.000.
Sprecker, Mark A.: *See—*
Light, Kenneth K.; Sanders, James Milton; Vock, Manfred Hugo; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja Dulal; Tseng, Ching Y.; and Sprecker, Mark A., 4,120,308, Cl. 131-17.00R.
Spurgin, William T., to Sperry Rand Corporation. Variable ratio helm. 4,120,258, Cl. 114-144.00E.

Staats, Henry N., to General Binding Corporation. Removable plastic binding. 4,120,517, Cl. 281-19.00R.

Stackpole Components Company: *See—*
Campbell, Dudley H.; and Overton, Arthur W., 4,121,071, Cl. 200-67.00G.

Stadler, Ruth A.: *See—*
Elger, Gerald W.; Stadler, Ruth A.; and Sanker, Philip E., 4,120,694, Cl. 75-1.00T.

Staeubli Ltd.: *See—*
Schwarz, Rudolf, 4,120,327, Cl. 139-71.000.

Standard Oil Company: *See—*
Bremer, Noel J.; White, James F.; and Milberger, Ernest C., 4,120,876, Cl. 260-346.750.
Valcho, Joseph J.; and Karll, Robert E., 4,120,800, Cl. 252-8.55D.

Standard Oil Company (Indiana): *See—*
Borg, Arthur C.; and Zletz, Alex, 4,120,344, Cl. 164-73.000.
Corkhill, David P., 4,121,191, Cl. 340-15.5DP.
Cropper, Wendell P., 4,120,659, Cl. 23-230.0PC.
Knepper, Jay C.; and Grossman, Eugene L., 4,120,355, Cl. 166-259.000.
Mufti, Irshad R., 4,120,199, Cl. 73-154.000.
Smith, James W., 4,121,297, Cl. 364-728.000.

Stapleton, Gerald F. Currency converter for use with pre-established and known conversion data. 4,120,451, Cl. 235-89.00R.

Starks, Charles M.; Jackson, Robert G.; Porchey, David V.; and Royer, Dennis J., to Continental Oil Company. Predominantly aliphatic lower hydrocarbon materials from carbonaceous solids. 4,120,881, Cl. 260-449.60R.

Stascavage, John A.; Rawls, William W.; and Buchholz, Alexander, to Cornell Iron Works, Inc. Closure. 4,120,340, Cl. 160-133.000.

State of Israel Ministry of Commerce and Industry, The: *See—*
Lopatin, George; and Lewin, Menachem, 4,120,141, Cl. 57-34.0HS.

Stauffer Chemical Company: *See—*
Grindstaff, Donald A.; and Eterno, John R., 4,120,989, Cl. 426-577.000.
Lynn, Charles Carl, 4,120,986, Cl. 426-549.000.

Stauner, Rudolf: *See—*
Hintsch, Otto; and Stauner, Rudolf, 4,120,329, Cl. 139-196.200.

Stazzone, Anthony N. Ring toss game device. 4,120,499, Cl. 273-100.000.

Steck, Howard A.: *See—*
DiVito, Ronald J.; and Steck, Howard A., 4,121,094, Cl. 235-92.0FL.

Steel Company of Canada Limited, The: *See—*
Prenn, Otto E., 4,121,042, Cl. 13-18.00R.

Steel, Francis Robert: *See—*
Irwin, James Stuart; and Steel, Francis Robert, 4,121,218, Cl. 343-702.000.

Stefanou, John. Reflecting and magnifying viewing apparatus. 4,120,563, Cl. 350-235.000.

Stein Industrie S.A.: *See—*
Pouderoux, Pierre, 4,120,348, Cl. 165-81.000.

Steinmeyer, Daniel E., to Monsanto Company. Separation of aerosols from gases in a horizontally disposed cylindrical fiber bed. 4,120,671, Cl. 55-96.000.

Stendel, Wilhelm: *See—*
Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Hammann, Ingeborg; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,120,956, Cl. 424-200.000.

Stepe, Visvaldis A., to Caterpillar Tractor Co. Bucket adapter with load absorbing means. 4,120,105, Cl. 37-142.00R.

Stephanos, Stephen P., to Lauer, George E. Photoelectric apparatus for sorting variegated articles according to size. 4,120,403, Cl. 209-564.000.

Stephenson, Robert Larry, to Allied Chemical Corporation. Comfort mechanism for seat belt retractor. 4,120,467, Cl. 242-107.000.

Sterling Drug Inc.: *See—*
Harrison, Thomas S.; and Doyle, Ross L., 4,120,414, Cl. 215-307.000.

Sterling-Winthrop Group Limited: *See—*
Blackband, Trevor William, 4,120,619, Cl. 417-511.000.

Stevens, Travis E.: *See—*
Emmons, William D.; and Stevens, Travis E., 4,120,839, Cl. 260-29.2EP.

Steward, William B., Jr.: *See—*
Walker, Clarence H., Jr.; and Steward, William B., Jr., 4,120,701, Cl. 148-4.000.

Stewart-Warner Corporation: *See—*
Crescenzi, Donald C., 4,120,071, Cl. 16-37.000.

Stiel, Donald Melvyn, to Hoffmann-La Roche Inc. Method invoking tabletting compression force control for optimizing tabletted formulation parameters. 4,121,289, Cl. 364-552.000.

Stitt, Robert M., to Burr-Brown Research Corporation. Optically coupled bias circuit for complementary output circuit and method. 4,121,168, Cl. 330-265.000.

Stoddard, William H., Jr.: *See—*
LeBlanc, Oliver H., Jr.; Niedrach, Leonard W.; and Stoddard, William H., Jr., 4,120,292, Cl. 128-2.00E.

Stoeberl, Helmut, to Klepper-Werke Kommanditgesellschaft. Molds for production of plastics material boats. 4,120,632, Cl. 425-405.00R.

Stone, Joseph James: *See—*
Diebold, Joseph M.; Arway, George; and Stone, Joseph James, 4,121,222, Cl. 346-75.000.

Stout, James E., to United States of America, Air Force. Time division digital multiplexer apparatus. 4,121,056, Cl. 179-15.0BM.

Strain, Patrick J. Polluting oil recovery apparatus. 4,120,793, Cl. 210-175.000.

Straitz, John F., III, to Combustion Unlimited Incorporated. Ignition system for flares. 4,120,638, Cl. 431-15.000.

Strange, Robert R.; and Zimmer, James M., to Crucible Inc. Method for ingot mold repair. 4,120,345, Cl. 164-92.000.

Streaty, Charles E.: *See—*
del Valle, Frank; Tuschhoff, John V.; and Streaty, Charles E., 4,120,983, Cl. 426-405.000.

Stubbings, James H., to Potomac Applied Mechanics, Inc. Locking mechanism. 4,120,181, Cl. 70-58.000.

Stuckmann, Dieter; and Jutte, Hans, to Gewerkschaft Eisenhutte Westfalia. Methods of and apparatus for driving tunnels. 4,120,165, Cl. 405-145.000.

Studebaker, Robert L. Detachable holder for beverage cans. 4,120,073, Cl. 16-114.00R.

Studiengesellschaft Kohle m.b.H.: *See—*
Wilke, Gunther; and Muller, Ernst Willi, 4,120,882, Cl. 260-439.00R.

Stupak, Leonid Mikhailovich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Stupak, Leonid Mikhailovich; Baglai, Viktor Mikhailovich; Bogachenko, Alexei Georgievich; Kazakov, Sergei Sergeevich; and Tsykulenko, Anatoly Konstantinovich, 4,120,695, Cl. 75-10.00C.

Sturm, Helmut, to Frank L. Wells Company. Coil spring feeding apparatus. 4,120,392, Cl. 198-451.000.

Stylar Industries, Inc.: *See—*
Fefferman, Frank J., 4,120,531, Cl. 297-349.000.

Suave Shoe Corporation: *See—*
Justamante, Juan, 4,120,477, Cl. 249-109.000.

Suchy, Milos: *See—*
Frater, Georg; Pfiffner, Albert; Suchy, Milos; and Zurfluh, Rene, 4,120,974, Cl. 424-278.000.

Sugiyama, Shunichi: *See—*
Miyauchi, Kohichiroh; Ohsumi, Atsushi; Haga, Yukio; Izumi, Tsutomu; Tsuru, Masahiro; Kunioka, Kazuo; and Sugiyama, Shunichi, 4,120,642, Cl. 432-12.000.

Suk, Eugene J., to Midland-Ross Corporation. Mounting bracket for electrical boxes. 4,120,416, Cl. 220-3.400.

Suk, Eugene J., to Midland-Ross Corporation. Mounting bracket for electrical boxes. 4,120,473, Cl. 248-205.00R.

Sulzer Brothers Limited: *See—*
Hintsch, Otto; and Stauner, Rudolf, 4,120,329, Cl. 139-196.200.
Kuenzli, Albert, 4,121,090, Cl. 219-284.000.

Sumitomo Chemical Company, Limited: *See—*
Fukushima, Nobuo; Uemura, Yukikazu; Okumura, Takuzo; and Hayashida, Haruo, 4,120,931, Cl. 264-288.000.
Nakaguchi, Kohei; Kawasumi, Shohachi; Hirooka, Masaaki; Yabuuchi, Hiroshi; and Takao, Hiroyoshi, 4,121,032, Cl. 526-197.000.
Yamazaki, Noboru; and Higashi, Fukuji, 4,120,853, Cl. 260-112.50R.

Sumitomo Electric Industries, Ltd.: *See—*
Nomura, Toshio; Asai, Tsuyoshi; Yamamoto, Takaharu; and Hara, Akio, 4,120,719, Cl. 75-238.000.

Superior Electric Company, The: *See—*
Leenhouts, Albert C., 4,121,144, Cl. 318-696.000.

Superior Tool & Manufacturing Company: *See—*
Engel, Hugo George, 4,120,119, Cl. 47-66.000.

Surman, Stuart A., to Surman, Stuart A. Method and apparatus for collecting precious metal particles. 4,120,121, Cl. 51-270.000.

Sutherland, Anthony Keith: *See—*
Venton, Peter Charles; Blench, Michael; Sutherland, Anthony Keith; and Hodges, Kenneth James Hamer, 4,121,286, Cl. 364-200.000.

Sutton, Jerry L.: *See—*
Allen, Royce; Sutton, Jerry L.; Griffin, Dan M.; Frye, Hal W.; and Colborn, Joseph G., 4,121,290, Cl. 364-565.000.

Suzuki, Kenichi: *See—*
Nakamura, Toshio; Hoshide, Yasuo; Hashimoto, Yoshio; Suzuki, Kenichi; and Yoshida, Yohji, 4,121,037, Cl. 544-313.000.

Sviokla, Sylvester Charles, to Alden Research Foundation. Electrochemical recording medium. 4,120,762, Cl. 204-2.000.

Swanson, Ronald E., to Acurex Corporation. Color sorter including a foreign object reject system. 4,120,402, Cl. 209-75.000.

Swartz, Delbert D.: *See—*
McRoskey, John W.; McRoskey, Leonard H.; and Swartz, Delbert D., 4,120,427, Cl. 222-193.000.

Swindells, Frank E.; and Klimas, Mary G., to United States of America, Army. Irreversible warmup indicator. 4,120,818, Cl. 116-114.00V.

Swisher, George W., Jr.: *See—*
Smith, Donald Wayne; Swisher, George W., Jr.; and Teel, Larry W., 4,120,106, Cl. 37-190.000.

Syntex (U.S.A.) Inc.: *See—*
Gaylord, Norman G., 4,120,570, Cl. 351-40.000.

Szabo, Francis S.: *See—*
Cowe, Alan B.; Kubinak, Ronald A.; Pick, George G.; Flanagan, Richard M.; and Szabo, Francis S., 4,121,228, Cl. 354-7.000.

Szekely, Paul: *See—*
Morser, Alfred Harold; Gibson, Roy; Szekely, Paul; and Parker, Bruce Trayton, 4,121,142, Cl. 318-345.00C.

Szporny, Laszlo: *See—*
Clauder, Otto; Kokosi, Jozsef; Szporny, Laszlo; and Karpati, Egon, 4,120,858, Cl. 260-293.550.

Tabata, Haruro: *See—*
Minekawa, Saburo; Yonekawa, Sigeru; Tabata, Haruro; Ishida, Takashi; Tsuchida, Satoshi; and Yamada, Kiyoshi, 4,121,031, Cl. 526-173.000.

Tagashira, Yoshimi: *See—*
Matsumoto, Youichi; and Tagashira, Yoshimi, 4,121,166, Cl. 329-122.000.

Taguchi, Michiichi: *See—*
Iizuka, Akio; Taguchi, Michiichi; and Kubo, Muneyuki, 4,120,821, Cl. 252-432.000.

Taguchi, Tatsuya; and Date, Nobuaki, to Canon Kabushiki Kaisha. Exposure factor setting device for a camera. 4,121,231, Cl. 354-38.000.

Taiko Rozai Co. Ltd.: *See—*
Taniguchi, Taizo; Iwasaki, Itsutoshi; Takeshige, Toshihiko; Onizuka, Koji; and Hashiguchi, Soichi, 4,120,734, Cl. 106-67.000.

Takahashi, Hiroshi; Hirai, Seizaburo; and Abo, Toshio, to Nippon Paint Co., Ltd. Levelling agent for aqueous paints. 4,120,841, Cl. 260-29.60H.

Takahashi, Isoji: *See—*
Matsumoto, Seiji; Takahashi, Isoji; Komaki, Takao; Ishida, Masamitsu; Kozeki, Tomotaka; Horikawa, Kazuo; and Shimanuki, Kozi, 4,121,101, Cl. 250-315.00A.

Takahashi, Koji; Akimoto, Taizo; Watanabe, Shigeru; and Terashita, Takaaki, to Fuji Photo Film Co., Ltd. Apparatus for automatically printing color photographs. 4,120,581, Cl. 355-38.000.

Takahashi, Masao: *See—*
Mori, Yoichi; Ueda, Kanichi; and Takahashi, Masao, 4,120,848, Cl. 528-67.000.

Takahashi, Shigeyuki: *See—*
Harada, Yuichi; Ishihara, Tetsuo; and Takahashi, Shigeyuki, 4,121,006, Cl. 428-172.000.

Takamatsu, Yukio; Wakabayashi, Takashi; Noda, Hideyo; Ichikawa, Kiyoshi; Kamegai, Tsuneteru; and Ikawa, Kazuo, to Nissan Motor Company, Limited. Cover member for a safety air-cushion device and a method of producing the same. 4,120,516, Cl. 280-728.000.

Takano, Teruhisa; Kurata, Noboru; Kusunoki, Shigeru; and Yoshimura, Hirofumi, to Matsushita Electric Industrial Co., Ltd. Microwave heating apparatus. 4,121,078, Cl. 219-10.55F.

Takao, Hiroyoshi: *See—*
Nakaguchi, Kohei; Kawasumi, Shohachi; Hirooka, Masaaki; Yabuuchi, Hiroshi; and Takao, Hiroyoshi, 4,121,032, Cl. 526-197.000.

Takatori Machinery Works, Ltd.: *See—*
Takatori, Osho; Nishikawa, Etsuo; and Fukuyama, Yosinobu, 4,120,251, Cl. 112-121.150.

Takatori, Osho; Nishikawa, Etsuo; and Fukuyama, Yosinobu, to Takatori Machinery Works, Ltd. Automatic method and apparatus for closing a toe end of a seamless hose material utilizing a straight line stitching by means of a stationarily disposed sewing machine. 4,120,251, Cl. 112-121.150.

Takeda Chemical Industries, Ltd.: *See—*
Numasaki, Kouichi; Sakai, Yoshihisa; Nawa, Takehiko; Matsumoto, Zenji; and Ninomiya, Nobutaka, 4,120,644, Cl. 432-99.000.

Takeshige, Toshihiko: *See—*
Taniguchi, Taizo; Iwasaki, Itsutoshi; Takeshige, Toshihiko; Onizuka, Koji; and Hashiguchi, Soichi, 4,120,734, Cl. 106-67.000.

Taketomi, Chiaki: *See—*
Ushio, Yoji; Taketomi, Chiaki; and Asaga, Tutomu, 4,121,262, Cl. 360-13.000.

Takeuchi, Jikko; and Mizuno, Masaya. Recording mechanism using ball-point-pen. 4,121,224, Cl. 346-139.00C.

Talmadge, Paul Conway, to Perkin-Elmer Corporation, The. High resolution stepping motor drive. 4,121,145, Cl. 318-696.000.

Tamaki, Kazuo: *See—*
Furukawa, Kaoru; Matsunami, Koichi; Ota, Toshihiko; Murakami, Tetsushi; Nagai, Hiroshi; and Tamaki, Kazuo, 4,120,928, Cl. 264-171.000.

Tamborski, Christ; and Christian, John B., to United States of America, Air Force. Fluorine-containing benzoxazoles. 4,120,863, Cl. 260-307.00D.

Tamura, Sadahiro: *See—*
Nishikawa, Toshio; Ito, Yoji; Ishikawa, Youhei; and Tamura, Sadahiro, 4,121,181, Cl. 333-73.00R.

Tanaka, Hideo: *See—*
Torii, Sigeru; Tanaka, Hideo; and Mishima, Kiyoshi, 4,120,764, Cl. 204-78.000.

Tanaka, Masaharu, to Mitsubishi Denki Kabushiki Kaisha. Double-break puffer-type compressed-gas circuit-breaker. 4,121,075, Cl. 200-148.00A.

Tanaka, Shoji: *See—*
Soma, Akiro; Kawashima, Haruro; Yamauchi, Makoto; and Tanaka, Shoji, 4,120,337, Cl. 152-353.00R.

Tang, Mou-Lin. Power generating and air conditioning system utilizing waste heat. 4,120,157, Cl. 60-618.000.

Tanguy, Denis R.; and Leising, Larry J., to Schlumberger Technology Corporation. Weight-on-bit measuring apparatus. 4,120,198, Cl. 73-151.000.

Taniguchi, Taizo; Iwasaki, Itsutoshi; Takeshige, Toshihiko; Onizuka, Koji; and Hashiguchi, Soichi, to Taiko Rozai Co. Ltd. Monolithic refractory compositions. 4,120,734, Cl. 106-67.000.

Tannenberger, Helmut: *See—*
Trojer, Felix; O'Connor, Grahame Paul; and Tannenberger, Helmut, 4,120,730, Cl. 106-39.600.

Tate, Dan C., to Champion International Corporation. Light weight aggregate and method for making same. 4,120,738, Cl. 106-288.00Q.

Tate, Frank M.: *See—*
Witmer, Clinton C.; and Tate, Frank M., 4,120,624, Cl. 425-71.000.

Tatsuta Densen Kabushiki Kaisha: *See—*
Terasawa, Shinichi; Okamura, Akitoshi; Okuyama, Shigeru; Nishiyama, Takehiko; and Nishida, Tadao, 4,120,139, Cl. 57-13.000.

Tatsuta, Sumitaka; Yamamoto, Nobuo; and Tsuji, Nobuo, to Fuji Photo Film Co., Ltd. Subbing material for styrene bases used in photographic elements. 4,120,724, Cl. 96-87.00A.

Taumann, Leonhard; and Schittenhelm, Rudolf, to Applied Radiation Corporation. Electron accelerator with a target exposed to the electron beam. 4,121,109, Cl. 250-505.000.

Taylor, Bruce George, to AMF Incorporated. Filter cartridge assembly. 4,120,794, Cl. 210-345.000.

Taylor, Glenn R.; Mullen, John H.; and Dobrosielski, Stephen S., to Westinghouse Electric Corp. Convertible switch. 4,121,076, Cl. 200-280.000.

Taylor, Jr. John W., to Westinghouse Electric Corp. Double sideband pulse radar. 4,121,212, Cl. 343-17.10R.

Taylor Machine Works, Inc.: *See—*
Boyles, Tonnie M.; and Hunter, Hubert E., 4,120,675, Cl. 55-431.000.

Teager, Thomas A., to Westinghouse Electric Corp. Automatic centrifugal babbitting apparatus and method. 4,120,346, Cl. 164-105.000.

Technical Research and Manufacturing, Inc.: *See—*
Greenway, Thomas H., 4,121,180, Cl. 333-10.000.

Technicon Instruments Corporation: *See—*
Adler, Stanford L.; and Gordon, Abraham, 4,120,262, Cl. 118-642.000.
Ornstein, Leonard; Williams, Hazel Elizabeth; and Intraub, Julius, 4,120,991, Cl. 427-2.000.

Teel, Larry W.: *See—*
Smith, Donald Wayne; Swisher, George W., Jr.; and Teel, Larry W., 4,120.106, Cl. 37-190.000.

Teknekron, Inc.: *See—*
Hibbard, Earl R., 4,121,245, Cl. 358-102.000.

Tektronix, Inc.: *See—*
Feucht, Dennis LeRoy, 4,121,164, Cl. 328-181.000.
Meigs, Gordon Wallace; and Thomas, Wayne Donald, 4,121,119, Cl. 307-351.000.
Murphy, Desmond Lewis, 4,121,183, Cl. 333-81.00R.
Rieger, Michael Lawrence, 4,121,299, Cl. 364-807.000.
Wetterling, Steven E., 4,121,120, Cl. 307-352.000.
White, Robert Edward; and Moeckli, David Edward, 4,121,113, Cl. 307-140.000.

Telecommunications Radioelectriques et Telephoniques T.R.T.: *See—*
Leal, Jean-Claude; Vannetzel, Henri; Grima, Jean-Claude; and David, Guy Albert Jules, 4,121,287, Cl. 364-461.000.

Telefonaktiebolaget L M Ericsson: *See—*
Endersz, Gyorgy Geza; and Forsberg, Gunnar Stefan, 4,121,095, Cl. 250-199.000.

Temchulla, Florian O.: *See—*
Van Steenberg, Wade M.; and Temchulla, Florian O., 4,120,224, Cl. 83-666.000.

Temple, Philip A.; Hasbrouck, Gene B.; and Howe, Stanley M., to Hon Industries Inc. Movable wall assembly. 4,120,124, Cl. 52-122.000.

Teramura, Hiroichi: *See—*
Nakagome, Yukio; Teramura, Hiroichi; Yamazaki, Yasuhiro; and Wakahara, Yasushi, 4,121,258, Cl. 358-260.000.

Terasawa, Shinichi; Okamura, Akitoshi; Okuyama, Shigeru; Nishiyama, Takehiko; and Nishida, Tadao, to Tatsuta Densen Kabushiki Kaisha. Cable making apparatus. 4,120,139, Cl. 57-13.000.

Terashita, Takaaki: *See—*
Takahashi, Koji; Akimoto, Taizo; Watanabe, Shigeru; and Terashita, Takaaki, 4,120,581, Cl. 355-38.000.

Terhune, James H.; and Neissel, John P., to General Electric Company. Shielded regenerative neutron detector. 4,121,106, Cl. 250-390.000.

Terzian, Rouben T.; Morrison, Howard J.; Schoenfield, Palmer J.; and Kuna, Wayne A., to Marvin Glass & Associates. Articulated figure toy. 4,120,117, Cl. 46-130.000.

Texaco Inc.: *See—*
Harnsberger, Bobby G., 4,120,359, Cl. 166-278.000.
Harnsberger, Bobby G., 4,120,842, Cl. 260-33.6UA.
Kalfoglou, George, 4,120,358, Cl. 166-275.000.

Texas Instruments Incorporated: *See—*
Bileski, Thomas; Crawford, Joe W.; Blanton, Bobby D.; Johnson, Carl N.; Garcia, Felix; Orcutt, John W.; Shepherd, Glen C.; and Oursler, James A., 4,121,073, Cl. 200-83.00P.
Coale, Cecil R., Jr., 4,121,248, Cl. 358-113.000.
Orcutt, John W.; and Mills, James M., 4,121,074, Cl. 200-83.00P.
Payne, Thomas R.; James, Harry K.; and Judy, Millard M., 4,120,744, Cl. 156-653.000.
Peterson, Robert K., 4,120,085, Cl. 29-600.000.

Textron, Inc.: *See—*
Braswell, James L.; Covington, Cecil E.; Phillips, Nolan B.; and Snyder, David E., 4,120,610, Cl. 416-226.000.
Ripley, Richard Edward, 4,120,149, Cl. 58-88.00R.

Th. Goldschmidt AG: *See—*
Schwarzmann, Gunter; Holtschmidt, Ulrich; and Bertelmann, Gunter, 4,120,979, Cl. 424-325.000.

Thekdi, Arvind C.; Chojnacki, Dennis A.; and Hemsath, Klaus H., to Midland-Ross Corporation. High momentum burners. 4,120,639, Cl. 431-158.000.

Thelman, John P.: *See—*
Auerbach, Andrew B.; Thelman, John P.; and Turbak, Albin F., 4,120,836, Cl. 260-15.000.

Thiel, Max: *See*—
Kampe, Wolfgang; Senn, Martin; Thiel, Max; Bartsch, Wolfgang; and Dietmann, Karl, 4,120,963, Cl. 424-256.000.

Thiokol Corporation: *See*—
Clark, Dwight P.; and Wagner, William F., 4,120,792, Cl. 210-152.000.
Hamner, James W.; Hightower, James O.; and Rector, Carl M., 4,120,709, Cl. 149-19.920.

Thomas, Derek Edward: *See*—
Cross, Raymond Peter; and Thomas, Derek Edward, 4,120,681, Cl. 65-114.000.

Thomas, Glenn R.: *See*—
Mrenna, Stephen A.; and Thomas, Glenn R., 4,121,077, Cl. 200-308.000.

Thomas, Herbert: *See*—
Seubert, Jurgen; Pohlke, Rolf; Thomas, Herbert; and Andrews, Peter, 4,120,961, Cl. 424-250.000.

Thomas, Wayne Donald: *See*—
Meigs, Gordon Wallace; and Thomas, Wayne Donald, 4,121,119, Cl. 307-351.000.

Thompson, Richard L.; Hubbert, Murray J.; and Wade, Vernon J., to Bettis Corporation. Rising stem valve actuator. 4,120,479, Cl. 251-56.000.

Thomson-CSF: *See*—
Ngu Tung, Pham, 4,121,116, Cl. 307-213.000.

Thornburg, David D., to Xerox Corporation. Tapered resistor meter. 4,121,153, Cl. 324-96.000.

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Kuhl, Karl-Heinz; Muranka, Eberhard; Schulz, Bernhard; and Tielens, Asmund, 4,121,189, Cl. 338-226.000.

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Liverant, Vladimir Leibovich; Yagupolsky, Lev Moiseevich; Ilichenko, Andrei Yakovlevich; Timashpolskaya, Faina Borisovna; Fedorovskaya, Elena Alexeevna; Petrik, Lidia Ivanovna; Kalantarov, Iosif Yakubovich; Kopylova, Mira Semenovna; and Meitus, Idima Evgenievna, 4,120,855, Cl. 260-153.000.

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Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Kamiyama, Setsuo; Kaneko, Katsumi; Nagashima, Yukio; Furukawa, Hiroshi; and Wada, Shozo, 4,120,908, Cl. 260-668.00A.
Okamoto, Nobukazu, 4,120,887, Cl. 260-462.00R.

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Yamaguchi, Masataka; Yamaguchi, Saeko; and Ohokubo, Tadashi, 4,120,079, Cl. 28-282.000.

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Tomlin, Malcolm George, to Coal Industry (Patents) Limited. Underground roadway or tunnel support. 4,120,164, Cl. 405-289.000.

Tomono, Makoto: *See*—
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Tomsic, Walter J.; and Hamilton, Floyd E., to Uniroyal, Inc. Leak-detecting apparatus. 4,120,193, Cl. 73-40.000.

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Mori, Yoichi; Ueda, Kanichi; and Takahashi, Masao, 4,120,848, Cl. 528-67.000.

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Torrington Company, The: *See*—
Bhateja, Chander Prakash; Alling, Richard Lassen; and Johnston, Dean Edward, 4,120,542, Cl. 308-219.000.

Toth, Klara: *See*—
Nagy, Geza; Pungor, Erno; Toth, Klara; Havas, Jeno; and Feher, Zsofia, 4,120,657, Cl. 23-230.00R.

Towmotor Corporation: *See*—
Jones, Francis L., 4,121,207, Cl. 340-648.000.
Samide, Frank R., 4,120,528, Cl. 296-107.000.

Townsend, John Melvin; and Valentine, Donald Herman, Jr., to Hoffmann-La Roche Inc. Metal phosphine complex. 4,120,870, Cl. 260-340.90R.

Toy Professionals Unlimited, Inc.: *See*—
Sommer, Irving, 4,120,493, Cl. 272-52.000.

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Furukawa, Kaoru; Matsunami, Koichi; Ota, Toshihiko; Murakami, Tetsushi; Nagai, Hiroshi; and Tamaki, Kazuo, 4,120,928, Cl. 264-171.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Ando, Masahisa; Katow, Keigo; and Yamazaki, Masami, 4,120,480, Cl. 251-61.500.

Tranchant, Jean Lucien: *See*—
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Transue, James A.: *See*—
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Witmer, Clinton C.; and Tate, Frank M., 4,120,624, Cl. 425-71.000.

Triebeneck, Kurt: *See*—
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Trizisky, Joseph Donnelly, to Du Pont de Nemours, E. I., and Company. Method and apparatus for the determination of oxidative stability of polymers under shear conditions. 4,120,660, Cl. 23-230.00R.

Trojer, Felix; O'Connor, Grahame Paul; and Tannenberger, Helmut, to Battelle Memorial Institute. Biocompatible ceramic glass. 4,120,730, Cl. 106-39.600.

Trowbridge, Lawrence E.: *See*—
Kennedy, Alvin B., Jr.; Shirey, Lawrence E.; Sharp, Harper Eugene; Trowbridge, Lawrence E.; and Magee, Robert L., 4,120,699, Cl. 134-1.000.

Troy, Stephen R.: *See*—
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TRW Inc.: *See*—
Kuhl, Karl-Heinz; Muranka, Eberhard; Schulz, Bernhard; and Tielens, Asmund, 4,121,189, Cl. 338-226.000.
Peck, Vincent W., 4,121,068, Cl. 200-67.00G.

Tsai, Reysen, to General Electric Company. Reverse power flow detector and control circuit. 4,121,271, Cl. 361-82.000.

Tseng, Ching Y.: *See*—
Light, Kenneth K.; Sanders, James Milton; Vock, Manfred Hugo; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja Dulal; Tseng, Ching Y.; and Sprecker, Mark A., 4,120,308, Cl. 131-17.00R.

Tsuboi, Yoshikazu; and Uzu, Yoshitomo, to Matsushita Electric Industrial Co., Ltd. Remote control system. 4,121,198, Cl. 340-171.00R.

Tsuchida, Satoshi: *See*—
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Tsuji, Nobuo: *See*—
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Tatsuta, Sumitaka; Yamamoto, Nobuo; and Tsuji, Nobuo, 4,120,724, Cl. 96-87.00A.

Tsukada, Toshihisa, to Hitachi, Ltd. Semiconductor device and a method of fabricating the same. 4,121,177, Cl. 331-94.50H.

Tsuru, Masahiro: *See*—
Miyauchi, Kohichiroh; Ohsumi, Atsushi; Haga, Yukio; Izumi, Tsutomu; Tsuru, Masahiro; Kunioka, Kazuo; and Sugiyama, Shunichi, 4,120,642, Cl. 432-12.000.

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Turbak, Albin F.: *See*—
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Turillon, Pierre Paul; Hull, Michael Neill; and Nordblom, George Frederick, to International Nickel Company, Inc., The; and ESB Corporation. Negative electrode for lead-acid storage battery. 4,121,024, Cl. 429-245.000.

Turnbull, George W.: *See*—
Armor, Anthony F.; Barton, Sterling C.; Chari, Madabushi V.; Collings, Harold E.; and Turnbull, George W., 4,121,126, Cl. 310-59.000.

Turnbull, Peter Dennis: *See*—
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Turner, Paul Allen: *See*—
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Turner, Ronald L.: *See*—
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Tuschhoff, John V.: *See*—
del Valle, Frank; Tuschhoff, John V.; and Streaty, Charles E., 4,120,983, Cl. 426-405.000.

Ueda, Kanichi: *See—*
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Ueda, Kenji, to Mitsubishi Jukogyo Kabushiki Kaisha. Surface treatment of metals. 4,120,760, Cl. 204-55.00R.
Uemura, Yukikazu: *See—*
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Uhlig, Herbert K.: *See—*
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Ulrich, Michael Henry: *See—*
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Umezawa, Hamao; and Kondo, Shinichi, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Method for production of kanamycin C and its derivatives. 4,120,955, Cl. 424-180.000.
Undin, Hans, to Pressmaster, Ltd. Electric power apparatus. 4,121,092, Cl. 219-501.000.
Union Carbide Corporation: *See—*
Doering, John Peter, 4,120,341, Cl. 160-213.000.
Engel, Stephen August, 4,120,703, Cl. 148-9.500.
Union Oil Company of California: *See—*
Fischer, Paul W.; Pye, David S.; and Gallus, Julius P., 4,120,369, Cl. 175-72.000.
Ward, John W., 4,120,825, Cl. 252-455.00Z.
Uniroyal, Inc.: *See—*
Brouwer, Walter G.; MacPherson, Edwin J.; Ames, Ronald B.; Neidermyer, Robert W.; and Crittendon, Charles E., 4,120,861, Cl. 260-302.00D.
Plant, Howard L.; Zukel, John W.; and Ames, Ronald B., 4,120,692, Cl. 71-94.000.
Shichman, Daniel, 4,120,339, Cl. 152-354.0RB.
Tomsic, Walter J.; and Hamilton, Floyd E., 4,120,193, Cl. 73-40.000.
Uniroyal Ltd.: *See—*
Brouwer, Walter G.; MacPherson, Edwin J.; Ames, Ronald B.; Neidermyer, Robert W.; and Crittendon, Charles E., 4,120,861, Cl. 260-302.00D.
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Snyder, David E., 4,120,315, Cl. 137-454.600.
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Air Force: *See—*
Baldwin, R. Bruce, 4,121,002, Cl. 428-36.000.
Crolius, Richard L., 4,121,123, Cl. 310-10.000.
Evers, Robert C.; and Abraham, Tonson, 4,120,900, Cl. 260-571.000.
Hamil, Roy A.; and Johnson, Alfred L., 4,121,175, Cl. 331-94.50D.
Hoffman, Charles R., Jr., 4,120,232, Cl. 89-1.50R.
Leeming, Harold, 4,120,195, Cl. 73-768.000.
Marinaccio, Richard E.; and Meier, Ward M., 4,121,214, Cl. 343-18.00E.
Oloff, Clarence M.; Karl, Alva A.; Wolff, Walter M.; Halbrook, Lloyd W.; Brown, Ray D.; and Dickey, Raymond G., 4,120,266, Cl. 119-103.000.
Pilipovich, Donald; Grant, Louis R., Jr.; and Wilson, Richard D., 4,120,904, Cl. 260-644.000.
Quigley, Richard E., Jr., 4,120,151, Cl. 60-39.46M.
Schlossberg, Howard R., 4,121,178, Cl. 331-94.50G.
Stout, James E., 4,121,056, Cl. 179-15.0BM.
Tamborski, Christ; and Christian, John B., 4,120,863, Cl. 260-307.00D.
Wakeman, Thomas G., 4,120,150, Cl. 60-39.09R.
Westermeier, Theodore F., 4,120,469, Cl. 244-194.000.
Witt, Richard P., 4,121,050, Cl. 178-67.000.
Army: *See—*
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Johnson, Richard N.; and Schneider, Marvin J., 4,121,196, Cl. 340-146.30P.
Price, G. Richard; and Plant, Jeffrey N., 4,120,547, Cl. 312-209.000.
Roberts, Thomas G., 4,121,128, Cl. 313-7.000.
Swindells, Frank E.; and Klimas, Mary G., 4,120,818, Cl. 116-114.00V.
Walker, Clarence H., Jr.; and Steward, William B., Jr., 4,120,701, Cl. 148-4.000.
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Peters, Howard M.; and Simon, Robert L., Jr., 4,120,710, Cl. 149-88.000.
Pierce, Bill L., 4,120,172, Cl. 62-115.000.
Rabl, Arnulf; and Rabl, Veronika, 4,120,565, Cl. 350-286.000.
Silver, Gary L., 4,120,933, Cl. 423-6.000.
Interior: *See—*
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Keating, Charles M., 4,121,154, Cl. 324-126.000.
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ap Rhys, Tomos L., 4,121,209, Cl. 343-7.700.
U.S. Philips Corporation: *See—*
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Lorteije, Jean Hubertus Josef; and Warrink, Geert, 4,121,256, Cl. 358-240.000.
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Schampers, Paulus Philippus Maria; Carasso, Marino Giuseppe; and Klostermann, Frits Theodoor, 4,121,255, Cl. 358-223.000.
Skoyles, Derek Robert, 4,120,317, Cl. 137-509.000.
Snijders, Wilfred Andre Maria; Verhoeckx, Nicolaas Alphonsus Maria; Van Gerwen, Petrus Josephus; and Van Essen, Hendrik Arie, 4,121,296, Cl. 364-724.000.
van Esdonk, Johannes; and Haans, Petrus Franciscus Antonius, 4,121,131, Cl. 313-402.000.
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University of Toronto, The Governing Council of the: *See—*
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Upjohn Company, The: *See—*
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Morton, Douglas Ross, Jr., 4,120,880, Cl. 260-408.000.
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Ushio, Yoji; Taketomi, Chiaki; and Asaga, Tutomu, to Clarion Co., Ltd. Magnetic recording/reproducing device. 4,121,262, Cl. 360-13.000.
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Vali, Victor; Shorthill, Richard W.; Goldstein, Raymond; and Krogstad, Reuben S., to University of Utah Research Institute. Double optical fiber waveguide ring laser gyroscope. 4,120,587, Cl. 356-106.0LR.
van den Bosch, Steven, to P.F.W. Beheer B.V. Sulfur-containing flavoring agents. 4,120,985, Cl. 426-535.000.
van der Burgt, Maarten J., to Shell Internationale Research Maatschappij B.V. Apparatus for the supply of fuel powder to a gas-pressurized vessel. 4,120,410, Cl. 214-17.00B.
Van der Horst, Eberhard, to A. Monforts. Turning machine tool. 4,120,219, Cl. 82-2.00R.
vander Werff, Bartele, to A. Vuyk & Zonen's Scheepswerven B.V. Hopper barge having a bottom discharge opening closable by hopper doors. 4,120,409, Cl. 214-15.00R.
van Esdonk, Johannes; and Haans, Petrus Franciscus Antonius, to U.S. Philips Corporation. Color television display tube and method of manufacturing same. 4,121,131, Cl. 313-402.000.
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van Valkenburg, Ludovicus Petrus Maria. Color detection device. 4,120,591, Cl. 356-178.000.
Vargiu, Silvio; Mazzoleni, Giorgio; and Pezzoli, Silvestro, to Societa'

Italiana Resine S.I.R. S.p.A. Process for the preparation of urea-formaldehyde condensates to be used as fertilizers. 4,120,685, Cl. 71-30.000.

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Vereinigte Österreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft: *See—*
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Verhoeckx, Nicolaas Alphonsus Maria: *See—*
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Viessmann, Hans. Connecting structure for shelves. 4,120,250, Cl. 108-144.000.

Vignot, Andre, to Societe Prodene. Dispensing pump having bellows metering chamber. 4,120,429, Cl. 222-207.000.

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Vinals, Joaquin: *See—*
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Light, Kenneth K.; Sanders, James Milton; Vock, Manfred Hugo; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja Dulal; Tseng, Ching Y.; and Sprecker, Mark A., 4,120,308, Cl. 131-17.00R.

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Simson, Reiner; Schindhelm, Karl-Heinz; and Vogel, Werner, 4,121,274, Cl. 361-273.000.

Vogt, Kurt. Clamping mechanism for temporarily clamping cables and the like. 4,120,209, Cl. 74-230.240.

Von Roll AG, Departement Bahn- und Stahlbau: *See—*
Muller, Werner A.; and Abegglen, Hans, 4,120,247, Cl. 104-208.000.

von Koch, Arwed, to Daimler-Benz Aktiengesellschaft. Electromagnetic control valve, especially for automatically shifting change-speed transmissions. 4,120,481, Cl. 251-129.000.

von Meyer, William C.: *See—*
Seidel, Michael C.; von Meyer, William C.; and Greenfield, Stanley A., 4,120,864, Cl. 260-308.00R.

Vornberger, Karl F.: *See—*
Vornberger, Walter; and Vornberger, Karl F., 4,120,063, Cl. 12-12.000.

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Vosbikian, Joseph; and Kalalian, John R. Bulky material compacter. 4,120,242, Cl. 100-212.000.

VRL Growth Associates, Inc.: *See—*
Rhoads, Kevin George; and Plotkin, George Michael, 4,120,305, Cl. 128-405.000.

Vyzkumny ustav bavlnarsky: *See—*
Bezstarosti, Ladislav; Lzicar, Josef; Lanta, Jiri; and Kriz, Vladimir, 4,120,326, Cl. 139-55.100.

W. R. Grace & Co.: *See—*
Bonet, Robert Andre, 4,120,716, Cl. 156-272.000.
Ketley, Arthur Donald; Hein, Paul Richard; and Yang, Michael Wen-Chien, 4,120,721, Cl. 96-36.300.

W. Schlafhorst & Co.: *See—*
Raasch, Hans; and Grecksch, Hans, 4,120,140, Cl. 57-34.00R.
Raasch, Hans; and Neuhaus, Hans Ludwig, 4,120,462, Cl. 242-45.000.
Rohner, Joachim, 4,120,526, Cl. 294-87.00R.

Wada, Shozo: *See—*
Kamiyama, Setsuo; Kaneko, Katsumi; Nagashima, Yukio; Furukawa, Hiroshi; and Wada, Shozo, 4,120,908, Cl. 260-668.00A.

Wade, Vernon J.: *See—*
Thompson, Richard L.; Hubbert, Murray J.; and Wade, Vernon J., 4,120,479, Cl. 251-56.000.

Wagner, David Lee, to Boeing Company, The. Pneumatic impact gun. 4,120,367, Cl. 173-137.000.

Wagner, William F.: *See—*
Clark, Dwight P.; and Wagner, William F., 4,120,792, Cl. 210-152.000.

Wainwright, Geoffrey Hugh, to Heat Trace Limited. Surface heating equipment. 4,121,093, Cl. 219-528.000.

Wakabayashi, Takashi: *See—*
Takamatsu, Yukio; Wakabayashi, Takashi; Noda, Hideyo; Ichikawa, Kiyoshi; Kamegai, Tsuneteru; and Ikawa, Kazuo, 4,120,516, Cl. 280-728.000.

Wakahara, Yasushi: *See—*
Nakagome, Yukio; Teramura, Hiroichi; Yamazaki, Yasuhiro; and Wakahara, Yasushi, 4,121,258, Cl. 358-260.000.

Wakeman, Thomas G., to United States of America, Air Force. Compact fuel-to-air heat exchanger for jet engine application. 4,120,150, Cl. 60-39.09R.

Waku, Makio: *See—*
Nakajima, Yasuo; Hayashi, Yoshimasa; and Waku, Makio, 4,121,064, Cl. 200-19.00A.

Wald, David K., to Du Pont de Nemours, E. I., and Company. Coating composition comprising a polysiloxane resin-forming precondensate, a fluorocarbon polymer, an epoxy resin, a silicone fluid, and an inorganic hardening agent. 4,121,000, Cl. 428-35.000.

Waldron, Clifford R.; Yonkers, Karl W.; and Uhlig, Herbert K., to Bendix Corporation, The. Electrical contact assembly. 4,120,556, Cl. 339-142.000.

Walker, Clarence H., Jr.; and Steward, William B., Jr., to United States of America, Army. Reactant for steel. 4,120,701, Cl. 148-4.000.

Walker, James Terrell, to Cromemco Inc. Interface device for encoding a digital image for a CRT display. 4,121,283, Cl. 364-200.000.

Wallace Murray Corporation: *See—*
Chou, Cheng-Chien; and Yee, Clifford Sau Leong, 4,120,609, Cl. 416-223.00R.
Matucheski, Joseph Victor, 4,120,257, Cl. 113-116.00D.

Wallman, Knut Olof Lennart. Method of making improved lug and hole connection between sheet metal elements. 4,120,084, Cl. 29-509.000.

Walters, Russell W., to BMR Security Products Corp. Lock assembly for high security container. 4,120,183, Cl. 70-159.000.

Ward, Clifford, to Ashland Oil, Inc. Metal complex and method for preparing. 4,120,865, Cl. 260-314.500.

Ward, Gaylan J. Automatic shut-down control system for truck diesel engines equipped with exhaust-driven superchargers. 4,120,278, Cl. 123-198.00D.

Ward, John W., to Union Oil Company of California. Hydrogenative conversion catalyst. 4,120,825, Cl. 252-455.00Z.

Wareham, Richard C. Apparatus for heating eyeglass frames. 4,121,091, Cl. 219-400.000.

Wargo, Thomas J., to Partlow Corporation. Thermocouple temperature measurement circuit having cold junction compensation. 4,120,201, Cl. 73-361.000.

Warneke, William Carl, to Borden, Inc. Direct production of coarse particle inorganic fluorides. 4,120,940, Cl. 423-490.000.

Warner-Lambert Company: *See—*
Hartenstein, Johannes; and Satzinger, Gerhard, 4,120,964, Cl. 424-258.000.

Warnke, Hans: *See—*
Togel, Kurt; Warnke, Hans; and Westerfeld, Horst, 4,120,218, Cl. 81-57.380.

Warrink, Geert: *See—*
Lorteije, Jean Hubertus Josef; and Warrink, Geert, 4,121,256, Cl. 358-240.000.

Wass, Richard. Fireplace heat exchanger. 4,120,281, Cl. 126-121.000.

Watanabe, Koji; Ohta, Mitsunori; and Tomono, Makoto, to Konishiroku Photo Industry Co., Ltd. Color transfer copying process and apparatus using charge removing electrodes. 4,120,577, Cl. 355-4.000.
Watanabe, Shigeru: *See*—
Takahashi, Koji; Akimoto, Taizo; Watanabe, Shigeru; and Terashita, Takaaki, 4,120,581, Cl. 355-38.000.
Watanabe, Shutoku: *See*—
Saiki, Yukimi; Oguino, Masanori; and Watanabe, Shutoku, 4,121,252, Cl. 358-169.000.
Watanabe, Toshiro: *See*—
Kubo, Sueki; Watanabe, Toshiro; Fujita, Masayuki; Matsuno, Tadahiko; and Morita, Akira, 4,120,260, Cl. 118-317.000.
Watanabe, Yasuo; and Isoyama, Seizi, to Dowa Mining Co., Ltd. Hexagonal-system ferrite powder, composite plastic-ferrite magnet comprising same and process for production thereof. 4,120,806, Cl. 252-62.540.
Watanabe, Yasuo; and Isoyama, Seizi, to Dowa Mining Co., Ltd. Process for producing hexagonal-system ferrite powder. 4,120,807, Cl. 252-62.620.
Wavin B.V.: *See*—
de Putter, Warner Jan, 4,120,325, Cl. 138-145.000.
Wayland, Paul O.: *See*—
Hruda, Robert M.; and Wayland, Paul O., 4,121,268, Cl. 361-3.000.
Wear, Charles W., to Youngstown Steel Door Company, The. Method and apparatus for welding workpieces. 4,121,084, Cl. 219-91.200.
Weathers, Paul, to Bunker Ramo Corporation. Carrier current appliance theft alarm. 4,121,201, Cl. 340-524.000.
Weber, Howard Fredrick: *See*—
Jarrett, Robert Benjamin; Pace, Wilson David; and Weber, Howard Fredrick, 4,121,273, Cl. 361-239.000.
Webster, Geoffrey R., to Bethlehem Steel Corporation. Method for injection molding plastic. 4,120,921, Cl. 264-23.000.
Weeks, Gregory Paul: *See*—
Fleming, Sydney Winn; and Weeks, Gregory Paul, 4,120,592, Cl. 356-201.000.
Weiler, Ernest D.; Weir, W. David; and Wolfersberger, Martha, to Rohm and Haas Company. Bis-phosphoramidates. 4,120,957, Cl. 424-204.000.
Weir, John D.: *See*—
Harrington, John H.; Smyth, Richard T.; and Weir, John D., 4,121,082, Cl. 219-76.160.
Weir, Robert H.: *See*—
Pruckmayr, Gerfried; and Weir, Robert H., 4,120,903, Cl. 260-615.00B.
Weir, W. David: *See*—
Weiler, Ernest D.; Weir, W. David; and Wolfersberger, Martha, 4,120,957, Cl. 424-204.000.
Weismann, Victor P. Method for manufacturing a wire matrix. 4,120,330, Cl. 140-112.000.
Welch, Stanley B.; Serrano, Juan de J.; and Chen, David Y., to General Electric Company. Bar graph type touch switch and display device. 4,121,204, Cl. 340-337.000.
Wells, Thomas R.: *See*—
Johnston, Robert F.; and Wells, Thomas R., 4,120,573, Cl. 353-27.00A.
Welp, Ulrich; and Sellien, Gero, to Microbox Dr. Welp GmbH & Co. Aperture card camera with device for spraying the exposed film. 4,121,236, Cl. 354-323.000.
Welstead, William John, Jr., to A. H. Robins Company, Incorporated. Heterocyclic analgetic and antidiarrheal compounds. 4,120,969, Cl. 424-267.000.
Weltman, Henry J.; Carroll, Mark T.; Halkias, John E.; Kaarlela, William T.; and Reynolds, Jack D., to General Dynamics Corporation. Castable magnetic particle flaw detection composition and method using constituents that are non-volatile and resistant to oxidation below 100° F and having a viscosity less than 12,000 centipoises. 4,121,157, Cl. 324-216.000.
Wenshau, Hugo: *See*—
Clements, George William; and Wenshau, Hugo, 4,120,203, Cl. 73-422.00R.
Wess, Guenter: *See*—
Hartmann, Heribert; and Wess, Guenter, 4,121,170, Cl. 331-1.00A.
West, Robert E., to Cascade Industries, Inc. Patio pool. 4,120,126, Cl. 52-169.700.
Westerfeld, Horst: *See*—
Togel, Kurt; Warnke, Hans; and Westerfeld, Horst, 4,120,218, Cl. 81-57.380.
Westermeier, Theodore F., to United States of America, Air Force. In-line actuator monitoring and control apparatus. 4,120,469, Cl. 244-194.000.
Western Electric Company, Inc.: *See*—
McPherson, Charles Allen, 4,121,015, Cl. 428-418.000.
Westinghouse Electric Corp.: *See*—
Bush, Louis W.; and Cumming, Allen R., 4,121,213, Cl. 343-17.700.
Hickam, William M., 4,121,288, Cl. 364-497.000.
Hruda, Robert M.; and Wayland, Paul O., 4,121,268, Cl. 361-3.000.
Kovatch, George N.; and Rosey, Richard, 4,121,276, Cl. 361-342.000.
Mrenna, Stephen A.; and Thomas, Glenn R., 4,121,077, Cl. 200-308.000.
Otto, Paul R.; and Leang, William N. C., 4,120,381, Cl. 187-29.00R.
Peterson, Charles A., 4,121,270, Cl. 361-54.000.
Petrie, Edward M., 4,120,913, Cl. 260-830.0TW.
Repsher, Robert W., 4,121,132, Cl. 313-486.000.
Rexroad, James O.; and Majcher, John P., 4,121,067, Cl. 200-50.0AA.
Santilli, James N., 4,121,186, Cl. 337-161.000.
Shirland, Fred A., 4,120,705, Cl. 148-174.000.
Taylor, Glenn R.; Mullen, John H.; and Dobrosielski, Stephen S., 4,121,076, Cl. 200-280.000.
Taylor, Jr. John W., 4,121,212, Cl. 343-17.10R.
Teager, Thomas A., 4,120,346, Cl. 164-105.000.
Wetterling, Steven E., to Tektronix, Inc. Clock driven voltage comparator employing master-slave configuration. 4,121,120, Cl. 307-352.000.
White Chemical Corporation: *See*—
Mischutin, Vladimir, 4,120,798, Cl. 252-8.100.
White, Donald A., to Monsanto Company. Electrochemical process for the preparation of acetals of 2-haloaldehydes. 4,120,761, Cl. 204-59.00R.
White, James F.: *See*—
Bremer, Noel J.; White, James F.; and Milberger, Ernest C., 4,120,876, Cl. 260-346.750.
White, Robert Edward; and Moeckli, David Edward, to Tektronix, Inc. Electric switch. 4,121,113, Cl. 307-140.000.
White, Von M. Barbecue pit hanger. 4,120,279, Cl. 126-30.000.
White, William Harold: *See*—
Edwards, Wales Dale; and White, William Harold, 4,121,203, Cl. 340-336.000.
Whitehead, Thomas Wilson, to Du Pont de Nemours, E. I., and Company. High-capacity centrifuge rotor. 4,120,450, Cl. 233-26.000.
Whitener, Philip Charles, to Boeing Company, The. Efficient trailing edge system for an aircraft wing. 4,120,470, Cl. 244-213.000.
Whitesel, J. Eric. Lamp module. 4,121,279, Cl. 362-297.000.
Whitwell, Robert J.; and Bolton, Theodore S., to Carrier Corporation. Apparatus for reducing condensate noise in an air conditioner. 4,120,170, Cl. 62-91.000.
Wicki, Heinz, to Sandoz Ltd. Disazo and trisazo dyes having a 1,3-diamino-, dihydroxy- or amino-hydroxy-benzene nucleus and metal complexes thereof. 4,120,854, Cl. 260-145.00C.
Wilhelm, Max, to Ciba-Geigy Corporation. Pharmaceutical composition for inhibiting and blocking cardioselective beta-receptors. 4,120,978, Cl. 424-322.000.
Wilhelm, Siegfried: *See*—
Schafer, Werner; Scholz, Hans-Albrecht; and Wilhelm, Siegfried, 4,120,837, Cl. 260-22.00S.
Wilke, Gunther; and Muller, Ernst Willi, to Studiengesellschaft Kohle m.b.H. Metal complexes. 4,120,882, Cl. 260-439.00R.
William H. Rorer, Inc.: *See*—
Diamond, Julius, 4,120,885, Cl. 260-455.00R.
Diamond, Julius, 4,120,889, Cl. 260-465.00K.
Williams, Frederick P., to Monarch Marking Systems, Inc. Tamper indicating labels. 4,121,003, Cl. 428-40.000.
Williams, Guy. Optical toy. 4,120,116, Cl. 46-1.00R.
Williams, Hazel Elizabeth: *See*—
Ornstein, Leonard; Williams, Hazel Elizabeth; and Intraub, Julius, 4,120,991, Cl. 427-2.000.
Williams, Martin M.: *See*—
Marchessault, Richard G.; Carter, Thomas P., Jr.; and Williams, Martin M., 4,121,028, Cl. 526-48.100.
Williamson, Lionel Herbert. Gas sampling apparatus. 4,120,192, Cl. 73-19.000.
Wilmotte, Stephan Hubert; Nautet, Jean Adolphe; and Economopoulos, Marios, to Centre de Recherches Metallurgiques-Centrum Voor Research In de Metallurgie. Apparatus for cooling metal sections. 4,120,455, Cl. 239-429.000.
Wilson, Dennis L., to GTE Sylvania Incorporated. System and method for determining position and velocity of an intruder from an array of sensors. 4,121,192, Cl. 340-16.00R.
Wilson, Eunice D. Disposable shower curtain ensemble. 4,120,343, Cl. 160-330.000.
Wilson, Gene W., to Raymond Lee Organization, Inc., The. Visual and radar emergency detection balloon. 4,120,259, Cl. 116-124.00B.
Wilson, Keith Collier: *See*—
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Wilson, Richard D.: *See*—
Pilipovich, Donald; Grant, Louis R., Jr.; and Wilson, Richard D., 4,120,904, Cl. 260-644.000.
Wilson, Stephen S., to Kilo Corporation. Object identification system. 4,121,102, Cl. 250-341.000.
Windmoller & Holscher: *See*—
Bosse, Frank, 4,120,223, Cl. 83-425.300.
Windows, Howard, Jr. Hand held mouthpiece visualizer for interior embouchure. 4,120,228, Cl. 84-453.000.
Winkler, Adolf, to Bayer Aktiengesellschaft. Preparation of arylsulphonium salts. 4,120,866, Cl. 260-315.000.
Winkler, Edward D.; and Dalrymple, Earl E., to Anderson Power Products, Inc. Switchable electrical connector. 4,120,552, Cl. 339-90.00R.
Winzer, Gerhard: *See*—
Baues, Peter; and Winzer, Gerhard, 4,120,560, Cl. 350-96.140.
Wirz, Arno, to Heidelberger Druckmaschinen Aktiengesellschaft. Gripper movement changeover device on a sheet-turning drum for perfector printing machines. 4,120,244, Cl. 101-230.000.
Wistrand, Per Folke Magnus: *See*—
Otteblad, Sven Ivar Arne; Brelen, Hans Erik Osborn; Wistrand, Per Folke Magnus; and Samuelson, Svante Ragnar, 4,120,387, Cl. 192-3.00S.
Witherspoon, David Lane: *See*—
Morgan, Ronald Wade; and Witherspoon, David Lane, 4,120,740, Cl. 156-522.000.

Witmer, Clinton C.; and Tate, Frank M., to Tri/Valley Growers. Apparatus for and method of forming food product into a strip or ribbon. 4,120,624, Cl. 425-71.000.

Witt, Richard P., to United States of America, Air Force. Differential tri-phase shift keyed modulation. 4,121,050, Cl. 178-67.000.

Witt, Richard P., to Wittronics, Inc. Integer weighted impulse equivalent coded signal processing apparatus. 4,121,295, Cl. 364-724.000.

Wittmann, Alfred: *See*—
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Wittronics, Inc.: *See*—
Witt, Richard P., 4,121,295, Cl. 364-724.000.

Witzke, Horst: *See*—
Deb, Satyendra Kumar; and Witzke, Horst, 4,120,568, Cl. 350-357.000.

Woerner, Frank Peter; Kan, Peter T.; and Falkenstein, Georg, to BASF Aktiengesellschaft. Storage-stable, liquid polyisocyanates possessing carbodiimide groups, and process for their manufacture. 4,120,884, Cl. 260-453.0SP.

Wohl, Ronald A.: *See*—
Diamond, Julius; and Wohl, Ronald A., 4,120,860, Cl. 260-296.00R.

Wolfe, Donna L. Electrode system for acquiring electrical signals from the heart. 4,120,294, Cl. 128-2.05T.

Wolfersberger, Martha: *See*—
Weiler, Ernest D.; Weir, W. David; and Wolfersberger, Martha, 4,120,957, Cl. 424-204.000.

Wolff, Walter M.: *See*—
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Wolfinger, John F., to General Electric Company. Torsional oscillation alarm system. 4,121,272, Cl. 361-236.000.

Wood, Michael J. Tube and plate heat exchanger. 4,120,267, Cl. 122-20.00B.

Woodard, Tony O., to Cutler-Hammer, Inc. Toggle switch lever lock. 4,121,065, Cl. 200-42.00T.

Wooldridge, Darrel M., to American Tractor Equipment Corporation. Automatic control device for tractor mounted tools. 4,120,364, Cl. 172-2.000.

Woolley, Graham Edward: *See*—
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Woosley, Vernon Earl: *See*—
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Worms, Karl-Heinz: *See*—
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Wotruba, Gottfried: *See*—
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Woulbroun, John M.: *See*—
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Wright, Francis C., to IU Conversion Systems, Inc. Sludge thickener apparatus and method. 4,120,791, Cl. 210-84.000.

Wright, George C.; and Butterfield, James L., to Morton-Norwich Products, Inc. 5-Amino-2-hydrazinopyridine and derivatives thereof. 4,121,035, Cl. 542-417.000.

Wright, George C.; and Butterfield, James L., to Morton-Norwich Products, Inc. 3-Amino-2-Hydrazinopyridine derivatives. 4,121,036, Cl. 542-417.000.

Wright, Paul L.: *See*—
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Wu, Alan Leo: *See*—
Hamilton, Dean Elwyn; Gaudreau, Marcel Pierre Joseph; and Wu, Alan Leo, 4,120,196, Cl. 73-104.000.

Wu, Anthony Wai: *See*—
Phipps, Peter Beverley; Sharma, Bhim Sain; and Wu, Anthony Wai, 4,120,995, Cl. 427-248.00A.

Wu, Yulin, to Phillips Petroleum Company. Oxidation product recovery. 4,120,902, Cl. 260-586.00R.

Wyckoff, Charles W.: *See*—
Edgerton, Harold Eugene; Wyckoff, Charles W.; and Rines, Robert Harvey, 4,121,190, Cl. 340-3.00R.

Xerox Corporation: *See*—
Babish, Andrew N., 4,120,576, Cl. 355-3.0DR.
Blossey, Daniel F., 4,121,261, Cl. 358-301.000.
Dye, Malcolm Stuart; Redman, Michael James; and Satchell, David W., 4,121,260, Cl. 358-295.000.
Fischbeck, Kenneth H.; and Vernon, Richard H., 4,121,227, Cl. 346-140.00R.
Mailloux, Louis D.; and Bollman, James E., 4,120,580, Cl. 355-14.000.
Maiorano, Dominick J., 4,120,579, Cl. 355-11.000.
Thornburg, David D., 4,121,153, Cl. 324-96.000.

Yabuuchi, Hiroshi: *See*—
Nakaguchi, Kohei; Kawasumi, Shohachi; Hirooka, Masaaki; Yabuuchi, Hiroshi; and Takao, Hiroyoshi, 4,121,032, Cl. 526-197.000.

Yagi, Kouichi; and Nakagawa, Yunosuke, to Kao Soap Co., Ltd. Safe bleaching compositions for colored and patterned fabrics. 4,120,811, Cl. 252-186.000.

Yagupolsky, Lev Moiseevich: *See*—
Liverant, Vladimir Leibovich; Yagupolsky, Lev Moiseevich; Ilichenko, Andrei Yakovlevich; Timashpolskaya, Faina Borisovna; Fedorovskaya, Elena Alexeevna; Petrik, Lidia Ivanovna; Kalantarov, Iosif Yakubovich; Kopylova, Mira Semenovna; and Meitus, Idima Evgenievna, 4,120,855, Cl. 260-153.000.

Yamada, Kiyoshi: *See*—
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Yamada, Mankichi; and Fujita, Hiroshi, to NGK Insulators, Ltd. Corona shielding by jumper assembly. 4,121,045, Cl. 174-141.00R.

Yamaguchi, Masataka; Yamaguchi, Saeko; and Ohokubo, Tadashi, to Tokyo Institute of Technology. Tow opening apparatus. 4,120,079, Cl. 28-282.000.

Yamaguchi, Namio; and Sato, Yasuyuki, to Matsushita Electric Industrial Co., Ltd. Color subcarrier generator. 4,121,243, Cl. 358-19.000.

Yamaguchi, Naomi: *See*—
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Yamamoto, Nobuo: *See*—
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Yamamoto, Takaharu: *See*—
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Yamashita, Hiroshi; Osawa, Sadao; Saida, Takashi; and Sakasai, Yutaka, to Fuji Photo Film Co., Ltd. Electrophotograhic liquid developer containing negatively charged toner. 4,120,805, Cl. 252-62.10L.

Yamashita, Sadahiko: *See*—
Makimoto, Mitsuo; and Yamashita, Sadahiko, 4,121,182, Cl. 333-73.00S.

Yamato Scale Co.: *See*—
Motooka, Akira; and Yoshida, Takeshi, 4,120,393, Cl. 198-460.000.

Yamauchi, Makoto: *See*—
Soma, Akiro; Kawashima, Haruro; Yamauchi, Makoto; and Tanaka, Shoji, 4,120,337, Cl. 152-353.00R.

Yamazaki, Masami: *See*—
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Yamazaki, Noboru; and Higashi, Fukuji, to Sumitomo Chemical Company, Limited. Esterification of carboxylic acids by contact with a phosphonium salt. 4,120,853, Cl. 260-112.50R.

Yamazaki, Yasuhiro: *See*—
Nakagome, Yukio; Teramura, Hiroichi; Yamazaki, Yasuhiro; and Wakahara, Yasushi, 4,121,258, Cl. 358-260.000.

Yan, Tsoung-Yuan: *See*—
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Yang, Michael Wen-Chien: *See*—
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Yankee, Ernest W. Cis-4,5-didehydro-11-deoxy-cis-13-PGE_1 analogs. 4,120,878, Cl. 260-408.000.

Yardney Electric Corporation: *See*—
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Yargeau, Brian A., to United Technologies Corporation. Fuel cell water conditioning process and system and deaerator for use therein. 4,120,787, Cl. 210-26.000.

Yasumoto, Akihiro: *See*—
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Yawata, Teizaburo: *See*—
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Yee, Clifford Sau Leong: *See*—
Chou, Cheng-Chien; and Yee, Clifford Sau Leong, 4,120,609, Cl. 416-223.00R.

Yerkes, Ronald W.: *See*—
Galanis, Tom L.; Hoffner, Joel L.; Clymer, John C.; Hostetter, Richard S., Jr.; Jones, Duane T.; and Yerkes, Ronald W., 4,121,292, Cl. 364-571.000.

Yokota, Akira, to Nissan Motor Company, Limited. Internal combustion engine. 4,120,154, Cl. 60-282.000.

Yomogida, Hisao: *See*—
Iwaisako, Toshiyuki; Yamaguchi, Naomi; Yomogida, Hisao; and Ito, Yoshinobu, 4,120,943, Cl. 423-628.000.

Yonekawa, Sigeru: *See*—
Minekawa, Saburo; Yonekawa, Sigeru; Tabata, Haruro; Ishida, Takashi; Tsuchida, Satoshi; and Yamada, Kiyoshi, 4,121,031, Cl. 526-173.000.

Yoneya, Kiyoo, to Yoshida Kogyo K.K. Pound fishing net structure. 4,120,113, Cl. 43-100.000.

Yonkers, Karl W.: *See*—
Waldron, Clifford R.; Yonkers, Karl W.; and Uhlig, Herbert K., 4,120,556, Cl. 339-142.000.

York, James Farnsworth: *See*—
Jameson, Melvin Neil; Klicker, James Donald; Krulik, Gerald Albert; and York, James Farnsworth, 4,120,822, Cl. 252-441.000.

Yoshida Kogyo K.K.: *See*—
Kagoura, Tetsuro, 4,120,525, Cl. 292-336.300.
Yoneya, Kiyoo, 4,120,113, Cl. 43-100.000.

Yoshida, Takeshi: *See*—
Motooka, Akira; and Yoshida, Takeshi, 4,120,393, Cl. 198-460.000.

Yoshida, Yohji: *See*—
Nakamura, Toshio; Hoshide, Yasuo; Hashimoto, Yoshio; Suzuki, Kenichi; and Yoshida, Yohji, 4,121,037, Cl. 544-313.000.

Yoshimura, Hirofumi: *See*—
Takano, Teruhisa; Kurata, Noboru; Kusunoki, Shigeru; and Yoshimura, Hirofumi, 4,121,078, Cl. 219-10.55F.
Yoshimura, Masatoshi: *See*—
Iizuka, Motohiko; Danjo, Hiroyuki; Ikeda, Kazuo; and Yoshimura, Masatoshi, 4,120,488, Cl. 266-281.000.
Young, Hurshel F. Sentinel system for grease extracting ventilators. 4,121,199, Cl. 340-611.000.
Young, John H.: *See*—
Hunt, Raymond L.; Lin, Ben H.; Ream, Thomas A.; Robertson, Gene D.; and Young, John H., 4,121,135, Cl. 315-169.00R.
Young, Nicholas Gordon: *See*—
Macrory, Richard Brabazon; and Young, Nicholas Gordon, 4,120,503, Cl. 273-244.000.
Young, Rodney Christopher: *See*—
Ganellin, Charon Robin; and Young, Rodney Christopher, 4,120,968, Cl. 424-263.000.
Ganellin, Charon Robin; and Young, Rodney Christopher, 4,120,973, Cl. 424-273.00R.
Young, Russell L., Jr. Ice-fishing tip-up. 4,120,111, Cl. 43-17.000.
Youngstown Steel Door Company, The: *See*—
Wear, Charles W., 4,121,084, Cl. 219-91.200.
Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Umezawa, Hamao; and Kondo, Shinichi, 4,120,955, Cl. 424-180.000.
Zap-Lok Systems International, Inc.: *See*—
Echols, Marvin C., 4,120,083, Cl. 29-458.000.
Zenith Radio Corporation: *See*—
Baur, Leslie L.; and Hajduk, Thaddeus J., 4,120,407, Cl. 214-6.0BA.
Zernig, Ernst; and Ruther, Manfred, to Richard Heinze GmbH & Co. KG, Firma. Assembly fixture for furniture. 4,120,598, Cl. 403-68.000.
Zhautykov, Anurbek Orymbekovich: *See*—
Akushsky, Izrail Yakovlevich; Burtsev, Vladimir Mikhailovich; Duisenov, Bulat Esenovich; Pak, Ivan Timofeevich; and Zhautykov, Anurbek Orymbekovich, 4,121,298, Cl. 364-746.000.
Ziegler, John S., to American Hospital Supply Corporation. Disposable pads for surgical instruments. 4,120,302, Cl. 128-322.000.
Zimmer, James H. Panel hoisting and positioning device. 4,120,484, Cl. 254-6.00C.
Zimmer, James M.: *See*—
Strange, Robert R.; and Zimmer, James M., 4,120,345, Cl. 164-92.000.
Zimmermann, Rudolf: *See*—
Rosch, Fritz; and Zimmermann, Rudolf, 4,120,081, Cl. 29-156.50R.
Zletz, Alex: *See*—
Borg, Arthur C.; and Zletz, Alex, 4,120,344, Cl. 164-73.000.
Zohn, Carole: *See*—
Zohn, Robert Allen; and Zohn, Carole, 4,120,371, Cl. 177-262.000.
Zohn, Robert Allen; and Zohn, Carole, to Correct Count Company Inc. Load holder extension for beam balance scales. 4,120,371, Cl. 177-262.000.
Zucker, Jerry, to Hudson Pulp & Paper Corp. Digester system for delivering wood chips in an even layer into a digester. 4,120,748, Cl. 162-242.000.
Zukel, John W.: *See*—
Plant, Howard L.; Zukel, John W.; and Ames, Ronald B., 4,120,692, Cl. 71-94.000.
Zurfluh, Rene: *See*—
Frater, Georg; Pfiffner, Albert; Suchy, Milos; and Zurfluh, Rene, 4,120,974, Cl. 424-278.000.
Zygiel, Alfred E., deceased (by Zygiel, Mary E., heiress and devisee), to Cornelius Company, The. Liquid dispensing pump. 4,120,424, Cl. 222-133.000.
Zygiel, Mary E., heiress and devisee: *See*—
Zygiel, Alfred E., deceased, 4,120,424, Cl. 222-133.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF OCTOBER, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Becker, Otto Alfred. Insulating wall unit. Re. 29,804, Cl. 52-172.000.

Breese, Clinton E., to Breese Manufacturing, Inc. Pipe cutting tool. Re. 29,803, Cl. 30-105.000.

Breese Manufacturing, Inc.: *See—*
Breese, Clinton E., Re. 29,803, Cl. 30-105.000.

Eastman Kodak Company: *See—*
Metzger, Lenard M., Re. 29,807, Cl. 358-54.000.

Gibson, Kirkland H.; and Protzmann, Henry E., to H. G. P. Corp. Method of treating yarns to provide kinking and/or mottled effects in fabrics. Re. 29,800, Cl. 28-218.000.

H. G. P. Corp.: *See—*
Gibson, Kirkland H.; and Protzmann, Henry E., Re. 29,800, Cl. 28-218.000.

Ichihara, Mutsuo: *See—*
Iida, Hirotaka; Masaoka, Hiroshi; Yamada, Michinobu; Ichihara, Mutsuo; Uebayashi, Yoshitaka; Tashiro, Koji; and Taketomo, Sadao, Re. 29,806, Cl. 418-178.000.

Iida, Hirotaka; Masaoka, Hiroshi; Yamada, Michinobu; Ichihara, Mutsuo; Uebayashi, Yoshitaka; Tashiro, Koji; and Taketomo, Sadao. Rotor housing for a rotary piston type engine and method for manufacturing the same. Re. 29,806, Cl. 418-178.000.

Kavick, Edward M.: *See—*
Whitledge, Jon K.; and Kavick, Edward M., Re. 29,802, Cl. 29-237.000.

Koehnen, Edward L. Loader attachment for handling logs, bales and the like. Re. 29,805, Cl. 214-147.00G.

Masaoka, Hiroshi: *See—*
Iida, Hirotaka; Masaoka, Hiroshi; Yamada, Michinobu; Ichihara, Mutsuo; Uebayashi, Yoshitaka; Tashiro, Koji; and Taketomo, Sadao, Re. 29,806, Cl. 418-178.000.

Metzger, Lenard M., to Eastman Kodak Company. Scanning apparatus responsive to the movement of image bearing media. Re. 29,807, Cl. 358-54.000.

Protzmann, Henry E.: *See—*
Gibson, Kirkland H.; and Protzmann, Henry E., Re. 29,800, Cl. 28-218.000.

Samuel Moore And Company: *See—*
Whitledge, Jon K., Re. 29,801, Cl. 29-237.000.

Samuel Moore and Company: *See—*
Whitledge, Jon K.; and Kavick, Edward M., Re. 29,802, Cl. 29-237.000.

Taketomo, Sadao: *See—*
Iida, Hirotaka; Masaoka, Hiroshi; Yamada, Michinobu; Ichihara, Mutsuo; Uebayashi, Yoshitaka; Tashiro, Koji; and Taketomo, Sadao, Re. 29,806, Cl. 418-178.000.

Tashiro, Koji: *See—*
Iida, Hirotaka; Masaoka, Hiroshi; Yamada, Michinobu; Ichihara, Mutsuo; Uebayashi, Yoshitaka; Tashiro, Koji; and Taketomo, Sadao, Re. 29,806, Cl. 418-178.000.

Uebayashi, Yoshitaka: *See—*
Iida, Hirotaka; Masaoka, Hiroshi; Yamada, Michinobu; Ichihara, Mutsuo; Uebayashi, Yoshitaka; Tashiro, Koji; and Taketomo, Sadao, Re. 29,806, Cl. 418-178.000.

Whitledge, Jon K., to Samuel Moore And Company. Swaging apparatus. Re. 29,801, Cl. 29-237.000.

Whitledge, Jon K.; and Kavick, Edward M., to Samuel Moore and Company. Swaging apparatus. Re. 29,802, Cl. 29-237.000.

Yamada, Michinobu: *See—*
Iida, Hirotaka; Masaoka, Hiroshi; Yamada, Michinobu; Ichihara, Mutsuo; Uebayashi, Yoshitaka; Tashiro, Koji; and Taketomo, Sadao, Re. 29,806, Cl. 418-178.000.

LIST OF PLANT PATENTEES

Anderson, Frederic W., to Reedley Nursery, Inc. Plum tree (25-P-40). 4,316, 10-17-78, Cl. 38.000.

Anderson, Frederic W., to Reedley Nursery, Inc. Nectarine tree (44-G-520). 4,318, 10-17-78, Cl. 41.000.

Anderson, Frederic W., to Burchell Nursery, Inc., The. Almond tree (17-J-495). 4,319, 10-17-78, Cl. 30.000.

Anderson, Frederick W. Dwarf peach tree (54-P-455). 4,317, 10-17-78, Cl. 43.000.

Burchell Nursery, Inc., The: *See—*
Anderson, Frederic W., 4,319, Cl. 30.000.

Reedley Nursery, Inc.: *See—*
Anderson, Frederic W., 4,316, Cl. 38.000.
Anderson, Frederic W., 4,318, Cl. 41.000.

LIST OF DESIGN PATENTEES

AAI Corporation: *See—*
Barr, Irwin R., 249,959, Cl. D25-21.000.
Barr, Irwin R., 249,960, Cl. D25-21.000.
Barr, Irwin R., 249,961, Cl. D25-21.000.
Barr, Irwin R., 249,962, Cl. D25-56.000.

All American Brush Mfg. Corporation: *See—*
Epstein, Carl, 249,909, Cl. D4-35.000.

Altec Corporation: *See—*
Bremseth, Gerald B., 249,941, Cl. D14-35.000.

Anchor Hocking Corporation: *See—*
Benes, Frank J.; and Thrush, James Lloyd, 249,940, Cl. D11-151.000.
Benes, Frank J., 249,967, Cl. D27-27.000.
Thrush, James Lloyd, 249,919, Cl. D7-14.000.

Anderson, Victor F., to Shell Oil Company. Shoe. 249,907, 10-17-78, Cl. D2-292.000.

Arnsteiner, Anton, to Blizzard Gesellschaft m.b.H. Ski. 249,974, 10-17-78, Cl. D34-14.00D.

Arnsteiner, Anton, to Blizzard Gesellschaft m.b.H. Ski. 249,975, 10-17-78, Cl. D34-14.00D.

Automation Systems, Inc.: *See—*
Bartlett, Peter G., 249,943, Cl. D13-12.000.

Barr, Irwin R., to AAI Corporation. Building. 249,959, 10-17-78, Cl. D25-21.000.

Barr, Irwin R., to AAI Corporation. Building. 249,960, 10-17-78, Cl. D25-21.000.

Barr, Irwin R., to AAI Corporation. Building. 249,961, 10-17-78, Cl. D25-21.000.

Barr, Irwin R., to AAI Corporation. Reflector concentrator useful for solar energy. 249,962, 10-17-78, Cl. D25-56.000.

Bartlett, Peter G., to Automation Systems, Inc. Demand controller component. 249,943, 10-17-78, Cl. D13-12.000.

Bayly, Peter K., to Wiltshire Cutlery Company Proprietary Limited. Scabbard for a knife. 249,923, 10-17-78, Cl. D7-74.000.

Beekenkamp, Gerald: *See—*
Norton, Ian F.; and Beekenkamp, Gerald, 249,973, Cl. D34-14.00B.

Benes, Frank J.; and Thrush, James Lloyd, to Anchor Hocking Corporation. Vase or similar article. 249,940, 10-17-78, Cl. D11-151.000.

Benes, Frank J., to Anchor Hocking Corporation. Ashtray or similar article. 249,967, 10-17-78, Cl. D27-27.000.

Bio-Dynamics Inc.: *See—*
Eicher, Palmer O.; and Ware, Dennert O., 249,957, Cl. D24-33.000.

Blizzard Gesellschaft m.b.H.: *See—*
Arnsteiner, Anton, 249,974, Cl. D34-14.00D.
Arnsteiner, Anton, 249,975, Cl. D34-14.00D.

Block, Robert S.; and Krieger, John F., to Block, Robert S. Mug. 249,918, 10-17-78, Cl. D7-9.000.

Bremseth, Gerald B., to Altec Corporation. Loudspeaker. 249,941, 10-17-78, Cl. D14-35.000.
Brutsman, James W., to Wyott Corporation. Hot topping dispenser. 249,948, 10-17-78, Cl. D15-111.000.
Buitrago, John A.: *See—*
Vargas, Joe M., 249,915, Cl. D6-198.000.
Cairnes, Denis; and Maltby, Derrick John, to Cairnes Maltby Associates Limited. Pedestal. 249,914, 10-17-78, Cl. D6-196.000.
Cairnes Maltby Associates Limited: *See—*
Cairnes, Denis; and Maltby, Derrick John, 249,914, Cl. D6-196.000.
Carlson, Ronald L.: *See—*
Shaffer, James R.; and Carlson, Ronald L., 249,938, Cl. D10-98.000.
Collins, Harry F., to Service Ideas, Inc. Combined holder-server tray and cooking pan. 249,916, 10-17-78, Cl. D7-3.000.
Collins, Harry F., to Service Ideas, Inc. Combined holder tray and cooking pan. 249,917, 10-17-78, Cl. D7-3.000.
Cooper, Richard A. Trim strip for partition wall. 249,965, 10-17-78, Cl. D25-76.000.
Corning Glass Works: *See—*
Potts, Robert S., 249,956, Cl. D24-29.000.
Cosentino, James A., to Executive, A Motor Hotel of Buffalo, Inc., The. Building portal. 249,963, 10-17-78, Cl. D25-59.000.
Cottrell, Edward D. Combined stick inserter and display stand for a food product. 249,910, 10-17-78, Cl. D6-25.000.
Cottrell, Edward D. Combined stick inserter and display stand for a food product. 249,911, 10-17-78, Cl. D6-25.000.
Cullers, Vincent T., to Vince Cullers Advertising, Inc. Cover for a food container or the like. 249,934, 10-17-78, Cl. D9-254.000.
Dammons, Donald P. Wrist strap for a watch and writing implements. 249,939, 10-17-78, Cl. D11-2.000.
de Nijs, Maximiliaan. Aerosol container. 249,928, 10-17-78, Cl. D9-9.000.
Drake, James. Combined bookholder and bookmark. 249,955, 10-17-78, Cl. D19-91.000.
E.G.O. Elektro-Geraete Blanc und Fischer: *See—*
Fischer, Karl, 249,924, Cl. D7-95.000.
Eicher, Palmer O.; and Ware, Dennert O., to Bio-Dynamics Inc. Hip cup prosthesis. 249,957, 10-17-78, Cl. D24-33.000.
Epstein, Carl, to All American Brush Mfg. Corporation. Vented hair brush. 249,909, 10-17-78, Cl. D4-35.000.
Eventoff, Frank. Stringed musical instrument. 249,980, 10-17-78, Cl. D56-1.00A.
Executive, A Motor Hotel of Buffalo, Inc., The: *See—*
Cosentino, James A., 249,963, Cl. D25-59.000.
Fernandez, Carlos. Music instrument case. 249,979, 10-17-78, Cl. D56-1.00B.
Fields, James A., Jr. Game table. 249,971, 10-17-78, Cl. D34-3.000.
Fischer, Karl, to E.G.O. Elektro-Geraete Blanc und Fischer. Basket insert for a frying pan. 249,924, 10-17-78, Cl. D7-95.000.
Freijd, Sven Ingvar Werner, to Saab-Scania Aktiebolag. Front panel for computer or similar article. 249,945, 10-17-78, Cl. D14-40.000.
Frieser, Friedrich Ernest. Serving board. 249,920, 10-17-78, Cl. D7-19.000.
Fritz Gegauf Aktiengesellschaft Bernina-Nahmaschinenfabrik: *See—*
Gegauf, Fritz, 249,947, Cl. D15-68.000.
Gabriel Industries, Inc.: *See—*
Kilander, Holger F., 249,977, Cl. D34-15.00R.
Gageby, Steven Douglas. Chair. 249,912, 10-17-78, Cl. D6-56.000.
Gegauf, Fritz, to Fritz Gegauf Aktiengesellschaft Bernina-Nahmaschinenfabrik. Combined sewing machine and case therefor. 249,947, 10-17-78, Cl. D15-68.000.
Goldman, Harley R.: *See—*
Hall, Stewart; and Goldman, Harley R., 249,922, Cl. D7-53.000.
Greb Industries Limited: *See—*
Norton, Ian F.; and Beekenkamp, Gerald, 249,973, Cl. D34-14.00B.
Gronert, Ronald. Construction piece. 249,976, 10-17-78, Cl. D34-15.0GG.
Hall, Stewart; and Goldman, Harley R. Herb separator. 249,922, 10-17-78, Cl. D7-53.000.
Ishida, Takeshi, to Kabushiki Kaisha Daini Seikosha. Electronic metronome. 249,936, 10-17-78, Cl. D10-43.000.
Isono, Nobujiro, to Shin Nippon Kinzoku Co., Ltd. Adjustably louvered roof plate. 249,964, 10-17-78, Cl. D25-74.000.
Jacobson, David J.; and Zaro, Marvin. Electrical battery test instrument. 249,937, 10-17-78, Cl. D10-77.000.
Kabushiki Kaisha Daini Seikosha: *See—*
Ishida, Takeshi, 249,936, Cl. D10-43.000.
Karp, Edward C., to Sanitary Scale Company. Label printer. 249,981, 10-17-78, Cl. D64-10.000.
Kilander, Holger F., to Gabriel Industries, Inc. Water toy. 249,977, 10-17-78, Cl. D34-15.00R.
King-Seeley Thermos Company: *See—*
Seager, Richard H., 249,930, Cl. D9-219.000.
Kiraly, Ernest F., to Warner-Lambert Company. Razor. 249,968, 10-17-78, Cl. D28-46.000.
Kohutis, Ann S.: *See—*
Kohutis, Eileen; and Kohutis, Ann S., 249,906, Cl. D2-74.000.
Kohutis, Eileen; and Kohutis, Ann S. Dress for non-ambulatory individuals. 249,906, 10-17-78, Cl. D2-74.000.
Krieger, John F.: *See—*
Block, Robert S.; and Krieger, John F., 249,918, Cl. D7-9.000.
Kubusheski, Kitty K. Cover for a tissue dispenser. 249,982, 10-17-78, Cl. D87-1.00R.
Lucas Industries Limited: *See—*
Smith, Gordon Roy Frank, 249,944, Cl. D13-24.000.
Maltby, Derrick John: *See—*
Cairnes, Denis; and Maltby, Derrick John, 249,914, Cl. D6-196.000.
Mankau, Dieter: *See—*
Mielke, Bodo; Mankau, Dieter; and Papke, Friedrich, 249,949, Cl. D16-01.000.
Marquis, Georges. Wall tile. 249,966, 10-17-78, Cl. D25-92.000.
McGraw-Edison Company: *See—*
Rice, Harold W., 249,925, Cl. D7-131.000.
Meierhoefer, Eugene J., to Warner-Lambert Company. Dispensing container for pharmaceutical diluents. 249,958, 10-17-78, Cl. D24-56.000.
Meinhart, Robert H. Walking sole for attachment to a cleated shoe. 249,908, 10-17-78, Cl. D2-317.000.
Metropolitan Wire Corporation: *See—*
Nicely, Charles W., 249,913, Cl. D6-188.000.
Mielke, Bodo; Mankau, Dieter; and Papke, Friedrich, to Rollei-Werke Franke & Heidecke. Mirror reflex camera. 249,949, 10-17-78, Cl. D16-01.000.
Minnesota Mining and Manufacturing Company: *See—*
Niles, Gerald J., 249,983, Cl. D87-1.00D.
Murphy, Granville P. Chess piece set. 249,972, 10-17-78, Cl. D34-5.0CH.
Nicely, Charles W., to Metropolitan Wire Corporation. File shelf. 249,913, 10-17-78, Cl. D6-188.000.
Niles, Gerald J., to Minnesota Mining and Manufacturing Company. Tape cartridge caddy for a car. 249,983, 10-17-78, Cl. D87-1.00D.
Norton, Ian F.; and Beekenkamp, Gerald, to Greb Industries Limited. Ice skate. 249,973, 10-17-78, Cl. D34-14.00B.
Ohtomo, Kazuhito, to Sansui Electric Co., Ltd. Amplifier. 249,946, 10-17-78, Cl. D14-96.000.
Papke, Friedrich: *See—*
Mielke, Bodo; Mankau, Dieter; and Papke, Friedrich, 249,949, Cl. D16-01.000.
Parker, Lynn V. Combined key chain fob and tab can opener. 249,984, 10-17-78, Cl. D87-8.300.
Polachek, Saulsbury & Hough: *See—*
Takahashi, Kiyoshi; Takahashi, Akira; Takahashi, Kazuo; and Takahashi, Takeshi, 249,927, Cl. D8-395.000.
Potts, Robert S., to Corning Glass Works. Electrode holder for pH meters and the like. 249,956, 10-17-78, Cl. D24-29.000.
Quaker Oats Company, The: *See—*
Samson, Jeffrey T., 249,978, Cl. D34-15.0AJ.
Rice, Harold W., to McGraw-Edison Company. Combined closure dispenser and battery powered drink mixer for a container. 249,925, 10-17-78, Cl. D7-131.000.
Rollei-Werke Franke & Heidecke: *See—*
Mielke, Bodo; Mankau, Dieter; and Papke, Friedrich, 249,949, Cl. D16-01.000.
Russert, Frank, to Warner-Lambert Company. Candy dispenser. 249,929, 10-17-78, Cl. D9-32.000.
Russert, Frank, to Warner-Lambert Company. Candy dispenser. 249,931, 10-17-78, Cl. D9-224.000.
Russert, Frank, to Warner-Lambert Company. Candy dispenser. 249,932, 10-17-78, Cl. D9-224.000.
Saab-Scania Aktiebolag: *See—*
Freijd, Sven Ingvar Werner, 249,945, Cl. D14-40.000.
Salem China Company, The: *See—*
Schreckengost, Don, 249,921, Cl. D7-54.000.
Samson, Jeffrey T., to Quaker Oats Company, The. Toy roller-grader. 249,978, 10-17-78, Cl. D34-15.0AJ.
Sanitary Scale Company: *See—*
Karp, Edward C., 249,981, Cl. D64-10.000.
Sansui Electric Co., Ltd.: *See—*
Ohtomo, Kazuhito, 249,946, Cl. D14-96.000.
Schreckengost, Don, to Salem China Company, The. Condiment dispenser. 249,921, 10-17-78, Cl. D7-54.000.
Seager, Richard H., to King-Seeley Thermos Company. Combined insulated food service tray and cover therefor. 249,930, 10-17-78, Cl. D9-219.000.
Service Ideas, Inc.: *See—*
Collins, Harry F., 249,916, Cl. D7-3.000.
Collins, Harry F., 249,917, Cl. D7-3.000.
Shaffer, James R.; and Carlson, Ronald L., to Sun Electric Corporation. Tachometer. 249,938, 10-17-78, Cl. D10-98.000.
Shell Oil Company: *See—*
Anderson, Victor F., 249,907, Cl. D2-292.000.
Shin Nippon Kinzoku Co., Ltd.: *See—*
Isono, Nobujiro, 249,964, Cl. D25-74.000.
Simmons Gun Specialties, Inc.: *See—*
Stark, Donald E., 249,954, Cl. D22-7.000.
Skrobisch, Alfred, to Staver Company, Incorporated, The. Variable character display. 249,985, 10-17-78, Cl. D96-12.00K.
Smith, Gordon Roy Frank, to Lucas Industries Limited. Battery terminal connector. 249,944, 10-17-78, Cl. D13-24.000.
Speakman, Neil William. Radio. 249,942, 10-17-78, Cl. D14-79.000.
Stark, Donald E., to Simmons Gun Specialties, Inc. Shotgun barrel. 249,954, 10-17-78, Cl. D22-7.000.
Staver Company, Incorporated, The: *See—*
Skrobisch, Alfred, 249,985, Cl. D96-12.00K.
Steel Products Manufacturing Co. Inc.: *See—*
Vogelsang, John E., 249,955, Cl. D23-42.000.
Stein, Age. Combined template and frame. 249,950, 10-17-78, Cl. D19-39.000.
Stein, Age. Combined template and frame. 249,951, 10-17-78, Cl. D19-39.000.

Stern, Walter, to Warner-Lambert Company. Candy dispenser. 249,933, 10-17-78, Cl. D9-224.000.
Sun Electric Corporation: *See*—
Shaffer, James R.; and Carlson, Ronald L., 249,938, Cl. D10-98.000.
Takahashi, Akira: *See*—
Takahashi, Kiyoshi; Takahashi, Akira; Takahashi, Kazuo; and Takahashi, Takeshi, 249,927, Cl. D8-395.000.
Takahashi, Kazuo: *See*—
Takahashi, Kiyoshi; Takahashi, Akira; Takahashi, Kazuo; and Takahashi, Takeshi, 249,927, Cl. D8-395.000.
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Takahashi, Takeshi: *See*—
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Thrush, James Lloyd, to Anchor Hocking Corporation. Tumbler or similar article. 249,919, 10-17-78, Cl. D7-14.000.
Thrush, James Lloyd: *See*—
Benes, Frank J.; and Thrush, James Lloyd, 249,940, Cl. D11-151.000.
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Cullers, Vincent T., 249,934, Cl. D9-254.000.
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Ware, Dennert O.: *See*—
Eicher, Palmer O.; and Ware, Dennert O., 249,957, Cl. D24-33.000.
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Kiraly, Ernest F., 249,968, Cl. D28-46.000.
Meierhoefer, Eugene J., 249,958, Cl. D24-56.000.
Russert, Frank, 249,929, Cl. D9-32.000.
Russert, Frank, 249,931, Cl. D9-224.000.
Russert, Frank, 249,932, Cl. D9-224.000.
Stern, Walter, 249,933, Cl. D9-224.000.
Weideskog, Knut Benny. Shaver. 249,969, 10-17-78, Cl. D28-49.000.
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CLASSIFICATION OF PATENTS

ISSUED OCTOBER 17, 1978

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

16 4,120,052
115 4,120,053
265 4,120,054

CLASS 4

324 4,120,055
4,120,056

CLASS 5

66 4,120,057
247 4,120,058
256 4,120,059
345 R 4,120,060
350 4,120,061
370 4,120,062

CLASS 8

17 4,120,647
85 R 4,120,648
94.11 4,120,649
109 4,120,650
111 4,120,651
4,120,652
137 4,120,653

CLASS 12

12 4,120,063
142 R 4,120,064

CLASS 13

18 R 4,121,042
34 4,121,043

CLASS 14

6 4,120,065
16.5 4,120,066
71.5 4,120,067

CLASS 15

160 4,120,068
250.32 4,120,069
306 B 4,120,070

CLASS 16

37 4,120,071
87 R 4,120,072
114 R 4,120,073
171 4,120,074

CLASS 17

1 R 4,120,075

CLASS 20

67 DB 4,121,070

CLASS 23

230 B 4,120,658
230 PC 4,120,659
230 R 4,120,657
4,120,660

CLASS 24

68 CD 4,120,076
130 4,120,077

CLASS 28

218 Re.29,800
251 R 4,120,781
252 4,120,078
282 4,120,079

CLASS 29

25.18 4,120,080
156.5 R 4,120,081
237 Re.29,801
Re.29,802
254 4,120,082
458 4,120,083
509 4,120,084
600 4,120,085
611 4,120,086
623.2 4,120,087

CLASS 30

105 Re.29,803
160 4,120,088
278 4,120,089

CLASS 32

14 A 4,120,090

CLASS 33

15 B 4,120,091
27 B 4,120,092
174 P 4,120,093
174 T 4,120,094
180 R 4,120,095
265 4,120,096
307 4,120,097

CLASS 34

9 4,120,098

CLASS 35

12 K 4,120,099
73 4,120,100

CLASS 36

4 4,120,101
71 4,120,102
97 4,120,103
117 4,120,104

CLASS 37

142 R 4,120,105
190 4,120,106

CLASS 40

336 4,120,107

CLASS 42

74 4,120,108
90 4,120,109

CLASS 43

3 4,120,110
17 4,120,111
19.2 4,120,112
100 4,120,113
137 4,120,114
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CLASS 44

1 R 4,120,664
4,120,665
10 R 4,120,666

CLASS 46

1 R 4,120,116
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201 4,120,118

CLASS 47

66 4,120,119

CLASS 49

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CLASS 51

270 4,120,121

CLASS 52

58 4,120,122
86 4,120,123
122 4,120,124
156 4,120,125
169.7 4,120,126
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173 R 4,120,128
219 4,120,129
285 4,120,130
310 4,120,131
478 4,120,132
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434 4,120,134
473 4,120,135

CLASS 55

48 4,120,667
72 4,120,668
73 4,120,669
90 4,120,670
96 4,120,671
112 4,120,672
205 4,120,673
302 4,120,674
431 4,120,675

CLASS 56

17.1 4,120,136
226 4,120,137
313 4,120,138

CLASS 57

13 4,120,139
34 AT 4,120,143
34 HS 4,120,141
34 R 4,120,140
4,120,142
77.4 4,120,144
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162 4,120,146

CLASS 58

50 R 4,120,147
85.5 4,120,148
88 R 4,120,149

CLASS 60

39.09 R 4,120,150
39.46 M 4,120,151
221 4,120,152
255 4,120,153
282 4,120,154
599 4,120,155
602 4,120,156
618 4,120,157
641 4,120,158
667 4,120,159
670 4,120,160
682 4,120,161
690 4,120,162

CLASS 62

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91 4,120,170
115 4,120,172
181 4,120,173
256 4,120,174

CLASS 64

15 B 4,120,175
21 4,120,176

CLASS 65

4 R 4,120,676
18 4,120,677
32 4,120,678
60 B 4,120,679
114 4,120,680
4,120,681
181 4,120,682
207 4,120,683
302 4,120,684

CLASS 66

40 4,120,177
63 4,120,178
145 R 4,120,179

CLASS 68

20 4,120,180

CLASS 70

58 4,120,181
63 4,120,182
159 4,120,183
389 4,120,184

CLASS 71

30 4,120,685
67 4,120,686
78 4,120,687
86 4,120,688
4,120,689
90 4,120,690
93 4,120,691
94 4,120,692
96 4,120,693

CLASS 72

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278 4,120,186
342 4,120,187
391 4,120,188
457 4,120,189
458 4,120,190

CLASS 73

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19 4,120,192
40 4,120,193
45.2 4,120,194
104 4,120,196
144 4,120,197
151 4,120,198
154 4,120,199
355 R 4,120,200
361 4,120,201
421 R 4,120,202
422 R 4,120,203
425.4 R 4,120,204
425.6 4,120,205
4,120,662
718 4,120,206
768 4,120,195

CLASS 74

10.33 4,120,207
128 4,120,208
230.24 4,120,209
242.13 R 4,120,210
473 R 4,120,211
476 4,120,212
688 4,120,213
860 4,120,214

CLASS 75

1 T 4,120,694
10 C 4,120,695
13 4,120,696
72 4,120,697
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238 4,120,719

CLASS 76

25 A 4,120,215

CLASS 81

3.46 A 4,120,216
9.51 4,120,217
57.38 4,120,218

CLASS 82

2 R 4,120,219

CLASS 83

62.1 4,120,221
99 4,120,222
425.3 4,120,223
666 4,120,224
886 4,120,220

CLASS 84

1.03 4,120,225
4,120,226
320 4,120,227
453 4,120,228
454 4,120,229

CLASS 85

1 T 4,120,230
3 R 4,120,231

CLASS 89

1.5 R 4,120,232

CLASS 91

511 4,120,233
518 4,120,234

CLASS 93

33 H 4,120,235

CLASS 96

1.5 N 4,120,720
36.3 4,120,721
49 4,120,722
74 4,120,723
87 A 4,120,724
97 4,120,725
107 4,120,726
114 4,120,727
114.1 4,120,728

CLASS 99

323.9 4,120,236
340 4,120,237
353 4,121,301

CLASS 100

11 4,120,238
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45 4,120,240
142 4,120,241
212 4,120,242
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CLASS 101

230 4,120,244
288 4,120,245

CLASS 102

24 HC 4,120,246

CLASS 104

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CLASS 106

35 4,120,729
39.6 4,120,730
44 4,120,731
47 Q 4,120,732
48 4,120,733
67 4,120,734
84 4,120,735
90 4,120,736
109 4,120,737
288 Q 4,120,738

CLASS 108

23 4,120,248
113 4,120,249
144 4,120,250

CLASS 112

121.15 4,120,251
143 4,120,252
151 4,120,253
158 E 4,120,254
222 4,120,255

CLASS 113

57 4,120,256
116 D 4,120,257

CLASS 114

144 E 4,120,258

CLASS 116

114 V 4,120,818
124 B 4,120,259

CLASS 118

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630 4,120,261
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CLASS 119

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CLASS 122

20 B 4,120,267

CLASS 123

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32 EE 4,120,269
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41.49 4,120,271
117 D 4,120,272
122 G 4,120,273
139 E 4,120,274
140 MC 4,120,275
148 CC 4,120,277
198 D 4,120,278

CLASS 124

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CLASS 126

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270 4,120,282
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271 4,120,285
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299 D 4,120,290

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2 E 4,120,292
2 V 4,120,291
2.05 F 4,120,295
2.05 T 4,120,294
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78 4,120,297
92 D 4,120,298
140 N 4,120,299
203 4,120,300
303 R 4,120,301
322 4,120,302
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348 4,120,304
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419 PT 4,120,306
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CLASS 131

17 R 4,120,308
170 R 4,120,309
261 B 4,120,310

CLASS 134

1 4,120,699
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CLASS 137

236 R 4,120,312
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271 4,120,321
329.4 4,120,314
454.6 4,120,315
498 4,120,316
509 4,120,317
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583 4,120,319
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CLASS 138

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CLASS 139

55.1 4,120,326
71 4,120,327
196.1 4,120,328
196.2 4,120,329

CLASS 140

112 4,120,330

CLASS 141

66 4,120,331
197 4,120,332

CLASS 144

312 4,120,333
326 R 4,120,334

CLASS 148

1.5 4,120,700
4 4,120,701
6.15 R 4,120,702
9.5 4,120,703
103 4,120,704
174 4,120,705
175 4,120,706
186 4,120,707

CLASS 149

17 4,120,708
19.92 4,120,709
88 4,120,710

CLASS 150

7 4,120,335

CLASS 152

216 4,120,336
353 R 4,120,337
354 R 4,120,338
354 RB 4,120,339

CLASS 156

69 4,120,711
71 4,120,712
72 4,120,713
131 4,120,714
245 4,120,749
252 4,120,715
272 4,120,716
405 R 4,120,717
499 4,120,718
506 4,120,739
522 4,120,740
4,120,741
608 4,120,742
620 4,120,743
653 4,120,744

CLASS 159

27 B 4,120,745
47 R 4,120,746

CLASS 160

133 4,120,340
213 4,120,341
310 4,120,342
330 4,120,343

CLASS 162

117 4,120,747
242 4,120,748

CLASS 164

73 4,120,344
92 4,120,345
105 4,120,346

CLASS 165

48 R 4,120,347
81 4,120,348
89 4,120,349
162 4,120,350
170 4,120,351
173 4,120,352

CLASS 166

65 R 4,120,353
251 4,120,354
259 4,120,355
267 4,120,356
272 4,120,357
275 4,120,358
278 4,120,359
293 4,120,360
294 4,120,361
339 4,120,362

CLASS 171

58 4,120,363

CLASS 172

2 4,120,364
488 4,120,365
805 4,120,366

CLASS 173

137 4,120,367

CLASS 174

68.5 4,121,044
141 R 4,121,045
4,121,046

CLASS 175

71 4,120,368
72 4,120,369

CLASS 176

60 4,120,750
73 4,120,752
78 4,120,751
86 R 4,120,753

CLASS 177

185 4,120,370
262 4,120,371

CLASS 178

3 4,121,047
17 C 4,121,048
18 4,121,049
67 4,121,050

CLASS 179

1 SM 4,121,051
2 A 4,121,053
2 DP 4,121,052
15 A 4,121,055
15 BD 4,121,054
15 BM 4,121,056
15 BS 4,121,057
15.55 T 4,121,058
100.1 DR 4,121,060
100.1 TD 4,121,059
156 R 4,121,061

CLASS 180

9.5 4,120,372
53 R 4,120,374
89.14 4,120,375
105 E 4,120,373

CLASS 181

204 4,120,376

CLASS 182

3 4,120,377
14 4,120,378
187 4,120,379

CLASS 184

15 R 4,120,380

CLASS 187

29 R 4,120,381

CLASS 188

1 B 4,120,382
31 4,120,383
32 4,120,384
181 R 4,120,385
218 XL 4,120,386

CLASS 192

3 S 4,120,387
105 A 4,120,388
129 A 4,120,389

CLASS 195

99 4,120,754
103.5 C 4,120,755

CLASS 198

309 4,120,390
347 4,120,391
451 4,120,392
460 4,120,393

CLASS 200

16 F 4,121,062
18 4,121,063
19 A 4,121,064
42 T 4,121,065
50 AA 4,121,067
51 R 4,121,066
67 A 4,121,069
4,121,072
67 G 4,121,068
4,121,071
83 P 4,121,073
4,121,074
148 A 4,121,075
280 4,121,076
308 4,121,077

CLASS 203

11 4,120,756

CLASS 204

2 4,120,762
2.1 4,120,757
10 4,120,758
14 R 4,120,759
55 R 4,120,760
59 R 4,120,761
73 R 4,120,763
78 4,120,764
149 4,120,765
158 R 4,120,766
4,120,767
181 C 4,120,768
186 4,120,769
195 R 4,120,770
225 4,120,771
252 4,120,772
4,120,773
294 4,120,774

CLASS 206

45.34 4,120,394
63.3 4,120,395
151 4,120,396
370 4,120,397
408 4,120,398
474 4,120,399
528 4,120,400
566 4,120,401
586 4,120,441

CLASS 208

11 E 4,120,775
11 LE 4,120,776
4,120,777
80 4,120,778
108 4,120,779
211 4,120,780
305 4,120,782

CLASS 209

18 4,120,783
75 4,120,402
399 4,120,784
401 4,120,785
454 4,120,786
564 4,120,403

CLASS 210

26 4,120,787
30 A 4,120,788
54 4,120,789
65 4,120,790
84 4,120,791
152 4,120,792
175 4,120,793
345 4,120,794
512 R 4,120,795
522 4,120,796
4,120,797

CLASS 213

61 4,120,404

CLASS 214

1 HH 4,120,405
6 BA 4,120,407
6 N 4,120,406
10 4,120,408
15 R 4,120,409
17 B 4,120,410
38 BA 4,120,411
63 4,120,412
147 G Re.29,805
394 4,120,413

CLASS 215

307 4,120,414

CLASS 219

10.55 B 4,121,079
10.55 F 4,121,078
69 E 4,121,081
69 W 4,121,080
76.16 4,121,082
4,121,083
91.2 4,121,084
121 EM 4,121,086
121 L 4,121,085
4,121,087
201 4,121,088
216 4,121,089
284 4,121,090
400 4,121,091
501 4,121,092
528 4,121,093

CLASS 220

1 T 4,120,415
3.4 4,120,416
6 4,120,417
66 4,120,419
416 4,120,420
423 4,120,421
444 4,120,418

CLASS 221

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115 4,120,423

CLASS 222

133 4,120,424
146 C 4,120,425
183 4,120,426
193 4,120,427
201 4,120,428
207 4,120,429
324 4,120,430
518 4,120,431
565 4,120,432

CLASS 223

95 4,120,433

CLASS 224

5 V 4,120,434
42.1 C 4,120,436
42.1 F 4,120,435
45 S 4,120,437

CLASS 227

147 4,120,438

CLASS 228

107 4,120,439
231 4,120,440

CLASS 229

15 4,120,442
42 4,120,443
49 4,120,444
53 4,120,445

CLASS 232

17 4,120,446

CLASS 233

7 4,120,447
22 4,120,448
23 R 4,120,449
26 4,120,450

CLASS 235

89 R 4,120,451
92 FL 4,121,094
381 4,120,452

CLASS 236

49 4,120,453

CLASS 239

177 4,120,454
429 4,120,455
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CLASS 241

46 R 4,120,457
186 R 4,120,458
186.2 4,120,459
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CLASS 242

45 4,120,462
56 R 4,120,463
72 R 4,120,464
84.2 A 4,120,465
107 4,120,467
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CLASS 244

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194 4,120,469
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CLASS 246

128 4,120,471

CLASS 248

205 R 4,120,473
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263 4,120,474
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CLASS 250

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202 4,121,096
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296 4,121,099
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315 A 4,121,101
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343 4,121,103
355 4,121,104
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61.5 4,120,480
129 4,120,481
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8.1 4,120,798
8.55 D 4,120,800
4,120,801
8.6 4,120,799
8.75 4,120,802
47.5 4,120,804
51.5 A 4,120,803
62.1 L 4,120,805
62.54 4,120,806
62.62 4,120,807
63.2 4,120,808
102 4,120,809
153 4,120,810
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4,120,812
194 4,120,813
301.4 P 4,120,814
341 4,120,815
361 4,120,816
364 4,120,817
413 4,120,819
429 B 4,120,820
432 4,120,821
441 4,120,822
442 4,120,823
447 4,120,824
455 Z 4,120,825
465 4,120,826
512 4,120,827
513 4,120,828
516 4,120,829
522 4,120,830

CLASS 254

6 C 4,120,484
88 4,120,485
150 R 4,120,486

CLASS 260

2.3 4,120,832
15 4,120,835
4,120,836
22 S 4,120,837
29.1 SB 4,120,838
29.2 EP 4,120,839
29.4 UA 4,120,840
29.6 H 4,120,841
33.6 UA 4,120,842
33.8 R 4,120,843
42 4,120,844
45.75 S 4,120,845
45.85 B 4,120,846
112.5 R 4,120,853
112.5 S 4,120,852
145 C 4,120,854
153 4,120,855
239.3 D 4,120,856
293.54 4,120,857
293.55 4,120,858
294.8 R 4,120,859
296 R 4,120,860
302 D 4,120,861
307 D 4,120,862
308 R 4,120,863
314.5 4,120,864
315 4,120,865
326.4 4,120,866
340.7 4,120,867
340.9 R 4,120,868
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343.21 4,120,870
343.3 R 4,120,873
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345.8 R 4,120,872
346.11 4,120,874
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348.23 4,120,876
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449.6 R 4,120,881
453 SP 4,120,884
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465 K 4,120,889
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507 R 4,120,894
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648 C 4,120,906
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674 A 4,120,911
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45.3 4,120,923
45.5 4,120,924
89 4,120,926
98 4,120,927
171 4,120,928
210 R 4,120,929
225 4,120,930
288 4,120,931
292 4,120,932

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	4,121,225		4,120,454		4,120,371		4,120,528		4,120,305		4,120,513
	4,121,226		4,120,658		4,120,398		4,120,543		4,120,340		4,120,610
	4,121,232		4,121,084		4,120,400		4,120,555		4,120,350		4,120,668
	4,121,233		4,121,176		4,120,453		4,120,557		4,120,416		4,120,699
	4,121,275	32 :	4,120,115		4,120,471		4,120,590		4,120,417		4,120,744
	4,121,280	33 :	4,120,594		4,120,484		4,120,601		4,120,473		4,120,820
	4,121,295		4,121,180		4,120,493		4,120,639		4,120,504		4,120,842
26 :	4,120,059	34 :	4,120,054		4,120,495		4,120,676		4,120,554		4,120,877
	4,120,068		4,120,111		4,120,500		4,120,678		4,120,595		4,120,919
	4,120,103		4,120,119		4,120,556		4,120,683		4,120,596		4,120,939
	4,120,112		4,120,210		4,120,558		4,120,684		4,120,638		4,121,033
	4,120,127		4,120,254		4,120,575		4,120,688		4,120,646		4,121,058
	4,120,136		4,120,284		4,120,576		4,120,698		4,120,687		4,121,073
	4,120,193		4,120,308		4,120,579		4,120,747		4,120,693		4,121,074
	4,120,289		4,120,331		4,120,580		4,120,766		4,120,705		4,121,140
	4,120,311		4,120,381		4,120,585		4,120,808		4,120,735		4,121,149
	4,120,413		4,120,395		4,120,600		4,120,819		4,120,815		4,121,157
	4,120,422		4,120,563		4,120,604		4,120,838		4,120,833		4,121,193
	4,120,430		4,120,567		4,120,608		4,120,845		4,120,839		4,121,200
	4,120,467		4,120,568		4,120,641		4,120,863		4,120,850		4,121,216
	4,120,529		4,120,570		4,120,669		4,120,876		4,120,864		4,121,227
	4,120,532		4,120,620		4,120,703		4,120,886		4,120,903		4,121,248
	4,120,582		4,120,640		4,120,731		4,120,900		4,120,913		4,121,271
	4,120,625		4,120,651		4,120,767		4,120,933		4,120,921	49 :	4,120,067
	4,120,650		4,120,652		4,120,773		4,120,948		4,120,957		4,120,279
	4,120,774		4,120,672		4,120,777		4,120,990		4,120,971		4,120,587
	4,120,799		4,120,697		4,120,827		4,121,003		4,120,996		4,120,776
	4,120,802		4,120,729		4,120,843		4,121,023		4,121,012		4,120,792
	4,120,803		4,120,782		4,120,846		4,121,124		4,121,014		4,121,290
	4,120,804		4,120,791		4,120,867		4,121,133		4,121,055	51 :	4,120,258
	4,120,829		4,120,798		4,120,891		4,121,207		4,121,067		4,120,343
	4,120,835		4,120,801		4,120,892	40 :	4,120,073		4,121,076		4,120,539
	4,120,844		4,120,809		4,120,893		4,120,106		4,121,077		4,120,969
	4,120,872		4,120,812		4,120,894		4,120,199		4,121,111		4,121,217
	4,120,878		4,120,836		4,120,895		4,120,295		4,121,139	53 :	4,120,145
	4,120,879		4,120,860		4,120,896		4,120,356		4,121,150		4,120,239
	4,120,880		4,120,870		4,120,945		4,120,361		4,121,276		4,120,332
	4,120,899		4,120,875		4,120,951		4,120,630		4,121,288		4,120,334
	4,120,918		4,120,885		4,120,953		4,120,637		4,121,291		4,120,367
	4,121,038		4,120,889		4,120,991		4,120,736		4,121,292		4,120,438
	4,121,102		4,120,910		4,121,034		4,120,769		4,121,294		4,120,458
27 :	Re.29,805		4,120,912		4,121,035		4,120,881	44 :	Re.29,800		4,120,470
	4,120,203		4,120,917		4,121,036		4,120,902		4,120,190		4,120,509
	4,120,206		4,120,922		4,121,048		4,120,907		4,120,288		4,120,540
	4,120,217		4,120,924		4,121,053		4,120,915		4,120,401		4,120,664
	4,120,236		4,120,930		4,121,082		4,120,944		4,130,538		4,120,712
	4,120,307		4,120,936		4,121,083		4,121,029	45 :	4,120,255		4,121,194
	4,120,363		4,120,947		4,121,126		4,121,242		4,120,411		4,121,219
	4,120,389		4,120,949		4,121,206		4,121,297		4,121,147		4,121,246
	4,120,718		4,120,954		4,121,210	41 :	4,120,215	47 :	4,120,088	54 :	4,120,390
	4,120,929		4,120,967		4,121,261		4,120,253		4,120,281		4,120,419
	4,120,984		4,120,978		4,121,263		4,120,259		4,120,405		4,120,535
	4,120,989		4,121,000		4,121,268		4,120,434		4,120,415		4,120,822
	4,121,070		4,121,009		4,121,272		4,120,435		4,120,772	55 :	4,120,075
	4,121,088		4,121,024		4,121,301		4,120,441		4,120,916		4,120,249
	4,121,156		4,121,039	37 :	4,120,052		4,120,512		4,121,247		4,120,293
	4,121,172		4,121,041		4,120,738		4,120,694	48 :	4,120,083		4,120,321
28 :	4,120,132		4,121,051		4,120,976		4,120,756		4,120,085		4,120,349
	4,120,675		4,121,129		4,121,065		4,121,113		4,120,095		4,120,374
29 :	4,120,107		4,121,130		4,121,071		4,121,119		4,120,097		4,120,392
	4,120,319		4,121,132	38 :	4,120,365		4,121,120		4,120,166		4,120,459
	4,120,351		4,121,137	39 :	Re.29,801		4,121,154		4,120,167		4,120,645
	4,120,446		4,121,167		Re.29,802		4,121,164		4,120,189		4,121,005
	4,120,469		4,121,201		4,120,150		4,121,183		4,120,198		4,121,010
	4,120,621		4,121,211		4,120,151		4,121,199		4,120,256		4,121,013
	4,120,654		4,121,228		4,120,191		4,121,299		4,120,264		4,121,017
	4,120,671		4,121,238		4,120,243	42 :	4,120,108		4,120,290		4,121,069
	4,120,689		4,121,249		4,120,248		4,120,121		4,120,301		4,121,072
	4,120,761		4,121,289		4,120,266		4,120,124		4,120,315		4,121,091
	4,120,874	35 :	4,121,175		4,120,274		4,120,126		4,120,318	56 :	4,120,546
	4,120,901	36 :	Re.29,807		4,120,285		4,120,137		4,120,353		4,120,612
	4,120,988		4,120,055								

DESIGN PATENTS

9 :	249,930		249,932	20 :	249,954		249,977		249,922	40 :	249,941
06 :	249,908		249,933	24 :	249,959		249,983		249,937	42 :	249,913
	249,915		249,934		249,960	28 :	249,971		249,963	48 :	249,970
	249,953		249,938		249,961	29 :	249,925		249,978		249,984
	249,972		249,939		249,962	34 :	249,906		249,985	53 :	249,950
	249,980		249,979	25 :	249,926		249,907	39 :	249,919		249,951
09 :	249,968		249,981		249,956		249,909		249,921	55 :	249,918
12 :	249,982	18 :	249,935	27 :	249,912		249,958		249,940		249,955
17 :	249,929		249,957		249,916	36 :	249,910		249,967	56 :	249,948
	249,931	19 :	249,943		249,917		249,911				

PLANT PATENTS

06 :	4,316		4,317		4,318		4,319				

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